PAGE 6

Issue 30

The Magazine for all ATARI computers

November/December 1987 £1·20



3-D ANIMATOR

Create 3-D animation on your XL or XE

LETTER CASTLE

Challenge yourself to some real puzzles

ST section

GEM from C
CYBERSTUDIO
GFA BASIC

THE LIVING DAYLIGHTS COMPETITION

Lots of James Bond goodies to be won!

AUTODUEL

SEVEN NEW MIND BLOWING SIMULATIONS FROM



STRATEGIC SIMULATIONS INC

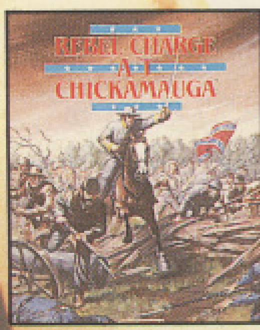
From the world's greatest creator of simulation software comes a further collection of outstanding challenges. Relive some of the momentous struggles that have changed the course of man's history; escape to worlds of fantasy and mystery where lies the unknown or create your own encounters played out in time and place of your own choosing. These are the challenges in which you take complete control.



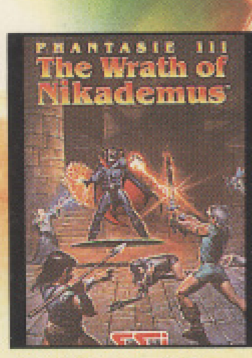
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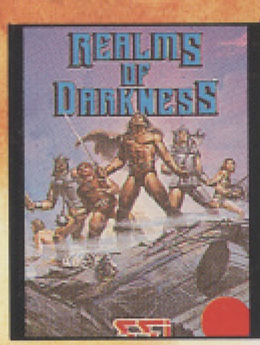
B – 24
"The most realistic flight simulation you're ever likely to experience"



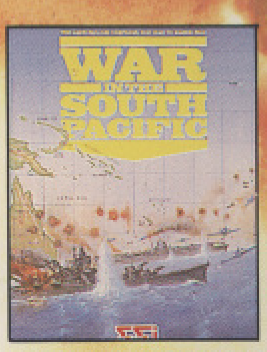
REBEL CHARGE AT CHICKAMAUGA
Is the definitive simulation of the South's last major offensive thrust – the Battle of Chickamauga. This game faithfully recreates the two-day battle to give you the opportunity to try and repeat or reverse history.
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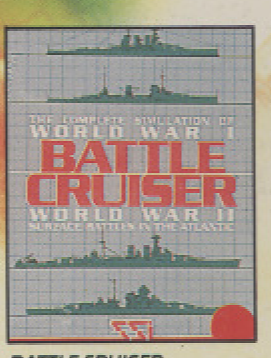
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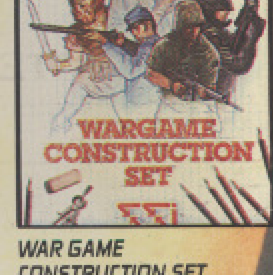
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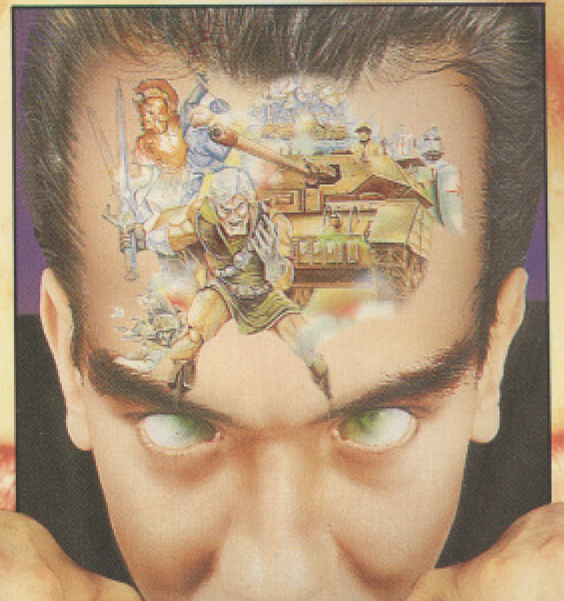
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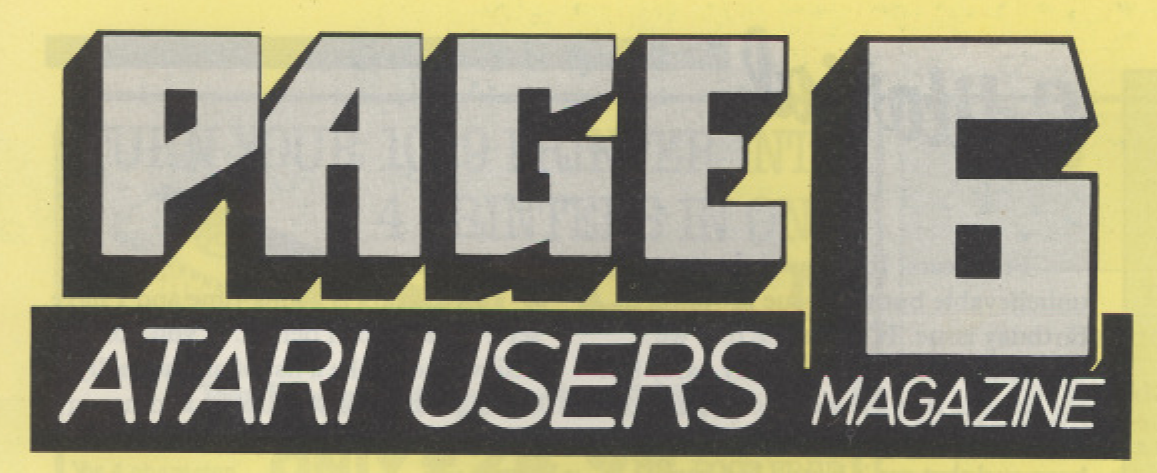
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November/December 1987

'The Magazine for the Dedicated Atari User'

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NEXT ISSUE ...

ORIGINAL SYNTH – a totally new way to get sound from your Atari keyboard, complete with light show!
FONTFACT – a character set designer for programmers from a young lady in Belgium
Next issue out early. On sale 17th December. Copy date 6th November.

PAGE 6 is published bi-monthly on the 1st of each alternate month.

PAGE 6 is a users' magazine which relies entirely on readers' support in submitting articles and programs. The aim is to explore ATARI computing through the exchange of information and knowledge. We will pay for articles and programs where appropriate and we hope that readers will enjoy seeing their work published. In turn we hope that other readers will learn from the articles and programs submitted and increase their enjoyment of Atari computing.

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ISSN No. 0952-4967

THE CREDITS

Full 'official' credits are on page 3, here are the people who made it possible.

Les Ellingham did the Editing

Nicola Parry looked after the ads

Phil Cardwell gave valuable Editorial Assistance

The **Regular Contributors** are ...

Garry Francis
Mark Hutchinson
Matthew Jones
John Davison
John Davison jr
John Sweeney
Paul Rixon

The superb Cover illustration and sundry other illustrations (also last issue) are by **Barry Armstrong**

All other contributors for this issue are credited alongside their articles or programs. Thanks to everybody for contributing and thus helping others.

Inspiration for this issue came from Van Morrison, Relativity, Nanci Griffith, Harvey Andrews, Pet Shop Boys, Pink Floyd, Lyle Lovett, Sipho Mabuse, Mary Coughlan, Heart, Neil Young and others. Also, and especially, from Sean who was three just before the typing started!

Serious? You bet! But Atari is supposed to fun as well isn't it?

The next issue of PAGE 6 could feature YOUR article or program. So, send it!

PAGE 6 is put together almost entirely with Atari equipment and software. Hardware used: 130XE, 1050 disk drive, 810 disk drive, 850 Interface, modem, NEC 8023 printer, 1040ST, SM124 monitor, Atari SH204 hard disk drive, Epson RX100 printer, Microstuffer Buffer. Software used: Superscript, Turbo Basic, Tele-Talk, Kermit, Print Wiz and several custom written utilities on the 8-bit. STwriter, PC Intercomm, Thunder and Fleet Street Publisher on the ST.
Copy is prepared on a 130XE using Superscript and various custom written programs and then transferred to the ST via 8-bit Kermit and PC Intercomm. It is then spell checked with Thunder and the layout drafted with Fleet Street Publisher. Finished copy is output from the ST to a Konnect 2 cassette machine and then fed into a Monotype Lasercomp typesetter.

Editorial

Five years! It seems almost unbelievable but this issue is our fifth birthday issue. It's a shame that we don't have time for a birthday party but the truth is that the world of Atari seems to be busier now than it has ever been and that can't be too bad can it? By the time you read this, the PCW Show with its Atari Village will have come and gone but as I write it is only a few days away and I have to complete most of this issue beforehand, spend a week at the show, and then finish it in two days after we come back! After that there is The Atari Christmas Show to look forward to at the end of November and it looks as if that might be just as hectic to fit in too!

Considering that the very first Atari only show was only last year, it seems amazing that we now seem to have two regular Atari Shows a year plus the largest presence of any manufacturer at the PCW Show. Things must be good in the world of Atari, or are they? It is a pity that all this show activity is not reflected elsewhere. Atari still doesn't have the same profile in the shops as certain other computers despite the fact that the ST seems to be the machine of the moment. It is still hard to find a decent range of Atari software, especially 8-bit, unless you happen to be lucky enough to live near a good established retailer who has stuck with Atari all along. There are not enough of these to cover the country though and the Atari 8-bit software market became almost exclusively mail order long ago. Dozens of 'companies' got in on the act in the early days but today only a few (the best or the honest) survive and, if you have not got a local shop, they deserve your support. What is worrying now is that these companies, and the shop retailers, are being hit hard by all the 'bright boys' who are jumping in to sell ST software at ridiculously discounted prices. Have you seen how many there are? In the short run the ST public might get a good deal, providing they get in quick enough before these boys disappear but in the long run we all might end up losing. Most of the 'cut price merchants' will disappear quickly because the market is just not big enough to support them all but what is worrying is that some of those who have supported Atari for a long time may be forced to go first and that is not right. Get a good price by all means but don't start complaining when (not if) one day you send off your money and don't get a reply.

Five years is a long time and I have seen it all happen before. If you don't believe me, make a list of all the really cheap places and then make another in six months time. I bet it won't be the same.

A NEW EDITORIAL ASSISTANT!

Let's get on to more pleasant things. This issue we have a new Editorial Assistant so perhaps you would welcome Phil Cardwell. He claims he's a real wizzo on the good old Atari 8-bit and we will hopefully see his influence in coming issues. We might also get a bit more ahead in planning each issue and dealing with your contributions as I have always been promising! We should also have just a little more time to address particular topics in the pages of PAGE 6 so if there is something you would like to see in future issues drop Phil a line and we'll see what can be done.

THANKS TO SOFTWARE EXPRESS

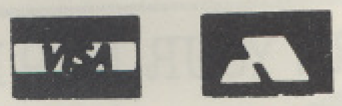
Here's a little tale. About two months ago my Atari Hard Disk drive died. I switched it on one morning and it didn't come on! If you know anything about Hard Disks you will know that they are delicate beasts and I did not want to send it through the post (God forbid!) so I dropped it into Software Express in Birmingham to see if they could repair it. It needed a new power supply, so they asked a few favours from Atari (as did I) and a mere two months later the part arrived! In the meantime I desperately needed a Hard Disk on two occasions so Software Express kindly loaned me one they had on loan on the first occasion and then cleared everything off the one they use themselves in the shop so I could borrow it to get the subscriptions out for the last issue *and I didn't even buy my drive from them in the first place!*

Obviously they can't do the same for everybody but it does illustrate a point I have often made before. Can you imagine getting that sort of support from the local Dixons or Boots! Do you see what I am getting at? I hope so.

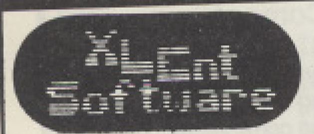
Anyway, thanks to Software Express without whose help these long nights would have been even longer!

Les Ellingham

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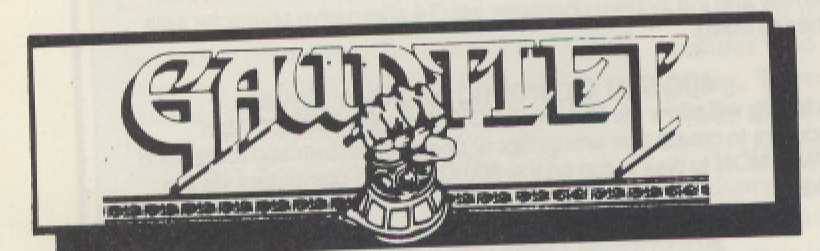
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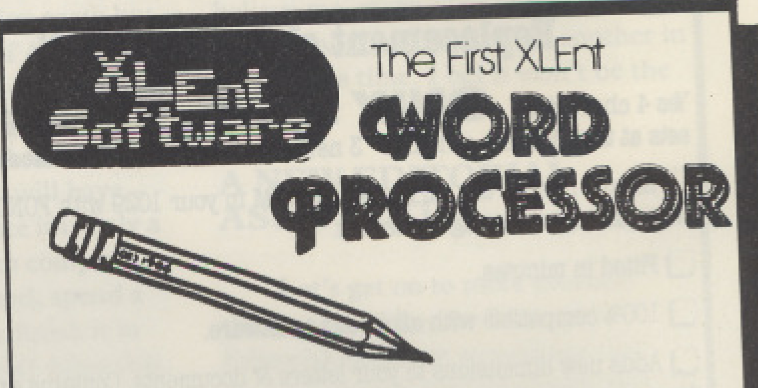
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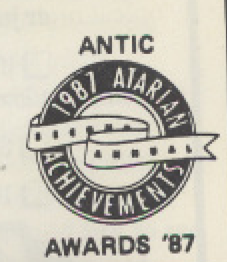
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SHE LOOKED DEEP INTO HIS SULTRY BLUE EYES ...

Infocom are a strange company aren't they? Following hot on the heels of The Lurking Horror, complete with slimy 'thing' in the box, comes Plundered Hearts a story of 'romance and adventure' which they claim is aimed specifically at the female market. Unfortunately, this means that they will sell about six copies so they have cleverly designed the game to be appealing to men as well and the pre-release testers (mostly men) have pronounced it quite acceptable.

Plundered Hearts is an adventure which 'provides the salt air, steamy tropical nights and treacherous characters essential to a heart-pounding adventure on the high seas. Little do you know that your innocent journey will soon turn to dangerous adventure. Explosives, rocky reefs and the vicious crocodiles are obstacles which you must overcome. True, it's not easy but at least you can control your fate. What you cannot control is much more dangerous, your passion for Nicholas Jamison, the handsome pirate captain. When you are in his arms you are apt to forget your mission'. Yuck! I hope they give you a sick bag in the box. Now where did I put that horrible slimy thing from the last one?

Plundered Hearts is available on the XL/XE for £24.99 and the ST for £29.99.

SORRY, JEFFREY, NOT A PENNY MORE ...



'If we can't get into movies with James Bond, let's chat up some bloke with influence in case he might make a movie of his latest book'. Remember those two guys from last issue posing as James Bonds? Well, now they have this crazy idea of producing a graphic adventure about a guy called Stephen Bradley who loses a small fortune by investing in a fraudulent oil company set up by multi millionaire Harvey Metcalfe. They are going to call this unlikely computer game Not a Penny More Not a Penny Less. Haven't I heard that somewhere before?

Mark Strachan and Dominic Wheatley of Domark are seen here discussing the fine details with the chap who is going to design the packaging, or is it the guy who wrote the book? Anyway the ST version of the game was demonstrated at the PCW Show and there will, hopefully, be an 8-bit version later in the year.

PCW STOP PRESS

The PCW Show occurred just as we went to press so we are unable to bring you a full report. Atari 8-bit software was thin on the ground but it was there with several re-releases on budget labels and a number of new titles. **STARS OF THE SHOW** – both for the ST. **WORD PERFECT** is 'four to six weeks away' and really is THE word processor all serious ST users have been waiting for. Complete with 115,000 word UK dictionary and thesaurus at £199. Expensive but worth it! **OMIKRON BASIC** is the first Basic for the ST that retains the 'feel' of Atari 8-bit Basic but with some incredibly powerful programming and editing features and a 'library' of routines similar to C. A full review of this one will be included as soon as possible.

NEW FRONTIERS

Excellent news for Atari 8-bit owners comes from Frontier Software who have recently signed a sole distributor agreement with ICD of Illinois, U.S.A. In case you don't know, ICD are responsible for Spartados and the U.S. Doubler among many other fine products.

The **US Doubler Chip** is a simply installed two chip upgrade for the 1050 disk drive giving true double density and an accelerated I/O rate designed to triple the speed of disk operations. It will cost just £29.95. Ideal for use with the US Doubler, but also a stand alone program is **Spartados**, widely acclaimed as the best DOS for the 8-bit Atari. Spartados supports everything from 810 to double density 1050 to RAM disks and Hard Disks. A special menu allows rapid transfer, erasure or locking of files using only the Space Bar, Option, Start and Select keys. There are several bonus features including a 32 character keyboard buffer, intelligent switching between drive densities, a binary file game menu, subdirectories and time and date stamping. Spartados also costs £29.95 or you can get a special double package with the US Doubler included for £49.95. Following the distribution agreement, Spartados will now come as standard on all Supra 8-bit Hard Disk drives.

Another product from ICD is P:R: Connection which is an interface unit designed to replace the elusive 850 interface. The unit includes a Centronics parallel port and two RS232 ports enabling the device to be used with any Centronics printer and modems. Price is £69.95.

These products should be at your local dealer now and more of ICD's range will be available shortly.

USER GROUPS GET TOGETHER

Ken Ward, long time champion of Atari and leading light behind the Norwich User Group has finally got together The Association of Atari User Groups which is a body whose aims are to represent Atari Users in consultation and discussion with software houses and Atari themselves. Ken has always been outspoken in his support for Atari Users and now with the backing of the Association we may well see more benefits for Atari Users in the U.K.

Already 17 Users Groups have become affiliated and the first newsletter has been produced but the Association wants to ensure that as many Atari owners as possible are represented so other Groups who have not yet affiliated are urged to get in touch with the AAUG as soon as possible. If you run a User Group, and you are serious about it, it will be in your interest and, more importantly, in the interest of your members to contact the AAUG right away. You can do it simply by writing to The Association of Atari User Groups, 45, Coleburn Road, Lakenham, Norwich, NR1 2NZ or by telephoning Ken Ward on 0603 661149.

AAUG news
NEWSLETTER OF THE ASSOCIATION OF ATARI USER GROUPS
ISSUE ONE — JULY 1987
WE'RE OFF! THE ASSOCIATION IS FINALLY A REALITY
THE PCW SHOW
AAUG ON SHOW
WHERE ARE THE OTHER GROUPS?

SOFTWARE SHORTS

Mastertronic and its associated labels keep the budget titles coming with September releases of Flash Gordon at £2.99 and Panther at £1.99 on the MAD label. On **Bulldog** at £1.99 comes Storm, an arcade adventure of sword and sorcery, magic and mayhem, Feud which features a magical encounter between two wizards and Revenge at Rigel which is a 'thrilling text adventure with inter-active graphics'. This last one was voted a C&VG Hit. Is that good or bad?

Rainbird have now released Guild of Thieves, the follow up to The Pawn, on the Atari 8-bit. There are many clever puzzles and surprises and 29 atmospheric scene setting illustrations on the two-disk set which retails at £19.95.

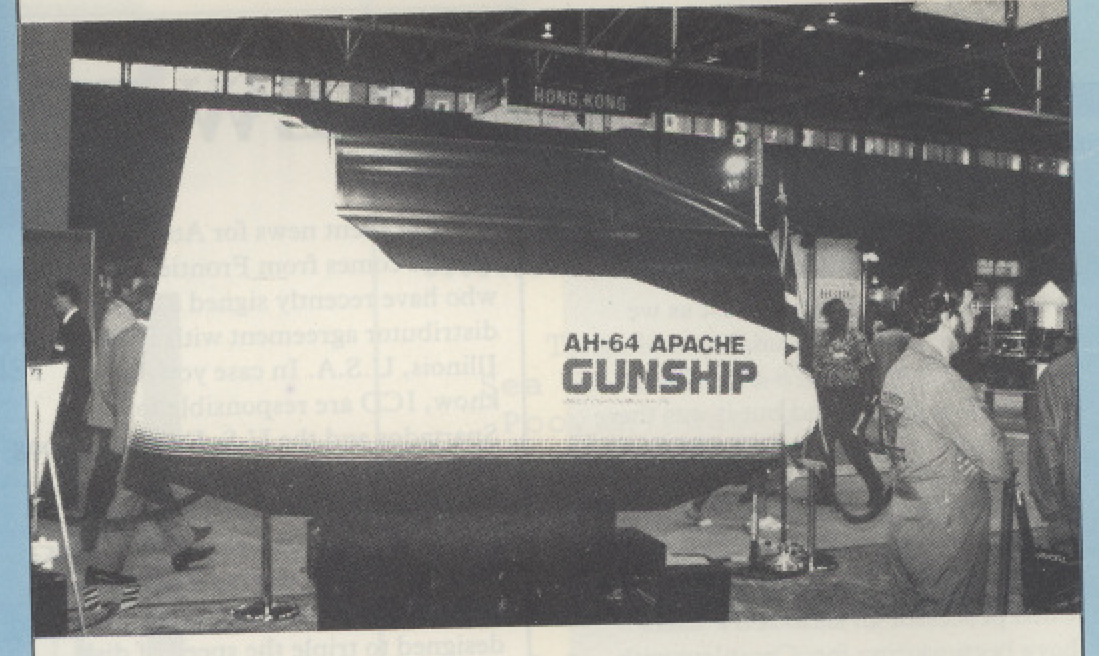
No more, everybody's keeping quiet until the PCW Show which is yet to come but will be gone by the time you read this, if you get the meaning!

ATARI CHRISTMAS SHOW

After weeks of speculation, Database have announced that there will be an Atari Christmas Show this year to be held on November 20th to 22nd at The Novotel Hotel, Hammersmith, London, scene of this year's previous Atari show. There was speculation that the show would be held in October but many exhibitors would still be trying to recover from the PCW Show and probably wouldn't have turned up! There was also speculation that this show would be for ST only but, thankfully, this is not the case. Whilst there may not be anywhere as near as much support for the 8-bit machines at these shows, it does represent one of the few opportunities for some 8-bit owners to see software that they cannot get locally. PAGE 6 will be there and will welcome 8-bit owners with open arms!

All that it needs now is for Database to organise a show in the North for all those users who can't afford to travel down to London twice a year. How about it?

MICROPROSE GUNSHIP FINALLY HERE!



Here is the ultimate in computer flight simulators from Microprose, a complete AH-64 Apache Gunship helicopter simulator on disk for your Atari with all manuals and associated hardware in the box. It is incredible value at around £19.95 but because of problems with carrying it home from your local shop (it weighs over 1.5 tonnes) you will have to pay a delivery charge of around 2 million dollars!

Seriously though, this is what Microprose had at the PCW Show to promote Gunship and it is a genuine helicopter flight simulator specially adapted to work with Microprose's Gunship program. Now that just has to be the ultimate in inter-active computer simulations!

How to Type in the Listings

and get them right!

The program listings in PAGE 6 are prepared carefully to ensure that they can be typed in as easily as possible. Before typing any listings ensure that you are familiar with the use of the Shift and CONTROL and INVERSE keys as outlined in your computer manual. The listings are prepared to match exactly what you see on screen. Every character that you may see in a listing is included in the chart below for cross reference. By using TYPO 3 you can ensure that you type in the programs EXACTLY as they are printed. Remember a single typing mistake may mean a program will not run.

WHAT ARE THOSE CODES?

Each line of a program begins with a special two letter code. THESE SHOULD NOT BE TYPED IN. They are used by the program TYPO to check that you have typed each line correctly. IF YOU HAVE NOT ALREADY TYPED IN THE TYPO 3 LISTING PLEASE DO SO NOW. The program can be used as you type in each line of a program or to check an already typed program. The code for each line will match but if you have problems check the listing conventions below carefully, you are most probably typing a CONTROL character incorrectly. TYPO 3 cannot check if a line has been missed so if you have problems in running a listing count the lines in the program and ensure none are missing. If the TYPO codes match and the program still does not run, LIST it to cassette or disk using LIST "C:" or LIST "D:filename", switch off the computer, re-boot and then ENTER the program using ENTER "C:" or ENTER "D:filename". Save this version in the normal way.

HOW TO USE TYPO 3

1. Type in the listing carefully for although you can use TYPO 3 to check itself (see 6 below) it may not work if you have made mistakes.

2. SAVE or CSAVE a copy of the program.

3. Each time you want to type in a program listing RUN TYPO 3 *first*. The program will install a machine code routine in memory and then delete itself. Now type in a line as shown in the magazine *excluding the first two letter code* and press RETURN.

4. A two letter code will appear at the top left of your screen. If this code matches the one in the magazine carry on and type the next line. Note, the code will not match if you use abbreviations. If you prefer to use abbreviations LIST the line you have just typed, move the cursor to that line and press RETURN. The code should now match.

5. If the code does not match, use the editing keys to correct the line and press RETURN again. Repeat if necessary until the codes match.

6. To check a line you have already typed LIST the line, place the cursor on that line and press RETURN.

7. When you have finished a listing just SAVE or CSAVE it in the normal way.

You can type in a program without using TYPO 3 and then check it by SAVEing or CSAVEing a copy of the program, running TYPO 3 and then LOADing or CLOADing your program and proceeding as in step 6 above.

Always SAVE or CSAVE a program before running it and always use TYPO before telling us that a program will not run.

```
EI 1 REM ********************************
AL 2 REM *  TYPO III by Alec Benson     *
         *            June 1985         *
SA 3 REM * A proofreader for ANTIC and *
         *   PAGE 6 based on TYPO II    *
         * published by ANTIC magazine *
EL 4 REM ********************************
SG 100 GRAPHICS 0
WG 110 FOR I=1536 TO 1791:READ A:CK=CK+A:
   POKE I,A:NEXT I
CG 120 IF CK<>30765 THEN ? "Error in DATA
    statements - Check Typing":END
YM 130 A=USR(1536)
VT 140 ? :? "TYPO III is up and running":
   NEW
MA 1000 DATA 104,160,0,105,26,3,201,69
HG 1010 DATA 240,8,200,200,200,192,36,208
OB 1020 DATA 242,96,200,169,79,153,26,3
RK 1030 DATA 200,169,6,153,26,3,162,0
RR 1040 DATA 189,0,228,157,79,6,232,224
TO 1050 DATA 15,208,245,169,93,141,83,6
KC 1060 DATA 169,6,141,84,6,173,4,228
EU 1070 DATA 105,0,141,95,6,173,5,228
BK 1080 DATA 105,0,141,96,6,169,0,162
KK 1090 DATA 3,149,203,202,16,251,96,0
ZR 1100 DATA 0,0,0,0,0,0,0,0
LD 1110 DATA 0,0,0,0,0,0,32,94
JM 1120 DATA 6,8,72,201,155,240,55,230
TV 1130 DATA 203,133,209,138,72,169,0,133
TW 1140 DATA 208,162,8,10,38,208,6,209
MF 1150 DATA 144,7,24,101,203,144,2,230
RL 1160 DATA 208,202,208,239,133,207,24,1
    65
TM 1170 DATA 204,101,207,133,204,165,205,
    101
AW 1180 DATA 208,133,205,165,206,105,0,13
    3
XH 1190 DATA 206,104,170,104,40,96,138,72
WR 1200 DATA 152,72,162,0,134,207,134,208
GF 1210 DATA 160,24,6,204,38,205,38,206
EA 1220 DATA 38,207,38,208,56,165,207,233
TM 1230 DATA 164,170,165,208,233,2,144,4
SK 1240 DATA 134,207,133,208,136,208,227,
    162
CB 1250 DATA 8,165,207,133,204,165,208,6
XN 1260 DATA 204,42,201,26,144,4,233,26
MB 1270 DATA 230,204,202,208,242,133,205,
    169
BC 1280 DATA 128,145,88,200,192,40,208,24
    9
WV 1290 DATA 165,204,105,160,160,3,145,88
QA 1300 DATA 165,205,24,105,161,200,145,8
    8
MQ 1310 DATA 32,69,6,104,168,76,153,6
```

Lower case	Inverse lower	Upper case or Shift	Inverse Upper or Shift	CTRL	Inverse CTRL
1	1	!	!		
2	2	"	"		
3	3	#	#		
4	4	$	$		
5	5	%	%		
6	6	&	&		
7	7	'	'		
8	8	@	@		
9	9	(	(		
0	0	)	)		
<	<				
>	>				
a	a	A	A		
b	b	B	B		
c	c	C	C		
d	d	D	D		

Lower case	Inverse lower	Upper case or Shift	Inverse Upper or Shift	CTRL	Inverse CTRL
e	e	E	E		
f	f	F	F	/	
g	g	G	G	\	
h	h	H	H		
i	i	I	I		
j	j	J	J		
k	k	K	K		
l	l	L	L		
m	m	M	M		
n	n	N	N		
o	o	O	O		
p	p	P	P		
q	q	Q	Q		
r	r	R	R		
s	s	S	S	+	
t	t	T	T	●	

Lower case	Inverse lower	Upper case or Shift	Inverse Upper or Shift	CTRL	Inverse CTRL
u	u	U	U		
v	v	V	V		
w	w	W	W		
x	x	X	X		
y	y	Y	Y		
z	z	Z	Z		
-	-	_	_		
=	=	|	|		
;	;	:	:	♠	
+	+	\	\		
*	*	^	^		
,	,	[	[	♥	
.	.	]	]	♦	
/	/	?	?		

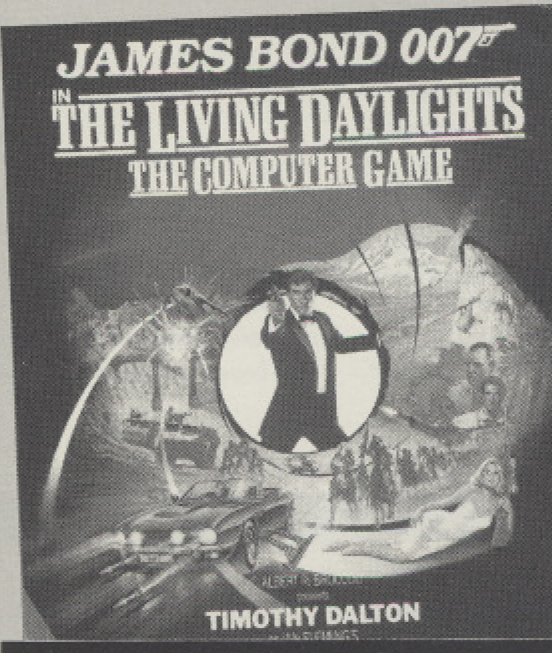
	ESC ESC
↑	ESC CTRL -
↓	ESC CTRL =
←	ESC CTRL +
→	ESC CTRL *
	ESC SHIFT CLEAR
◀	ESC DELETE
▶	ESC TAB
	ESC SHIFT DELETE
	ESC SHIFT INSERT
	ESC CTRL TAB
	ESC SHIFT TAB
	ESC CTRL 2
	ESC CTRL DELETE
	ESC CTRL INSERT

■ INVERSE SPACE

THE LIVING DAYLIGHTS

COMPETITION

This issue we have another FREE to enter competition with prizes courtesy of Domark. Just answer five simple questions and you could be part of the world of James Bond!



THE QUESTIONS

1. How many Bonds so far? Be careful!
2. Who wrote the Bond movie theme?
3. Who is the top villain in THE LIVING DAYLIGHTS?
4. Who is Bond's boss?
5. How many levels in Domark's THE LIVING DAYLIGHTS computer game?

That's it. Rack you brains, look up the answers or go and see the film. It's easy really!

10 FIRST PRIZES!!

1st Prize is a copy of THE LIVING DAYLIGHTS Soundtrack album PLUS a copy of the super, new JAMES BOND MOVIE BOOK detailing 25 years of Bond movies AND a James Bond Whistling Key Ring as featured in the film! Great value for any Bond fan and there are TEN of these prizes available!

20 RUNNERS UP PRIZES!!

If you are not among the lucky 10, you may still get a James Bond Whistling Key Ring as a runner-up. We have 20 of these on offer so you have a good chance of winning a prize.

RULES

1. One entry per reader only
2. The winners will be drawn from all correct entries received on or before 17th December 1987

HOW TO ENTER

Write your name and address on a postcard (preferably) or on a plain sheet of paper and alongside write the numbers of the questions above with your answer alongside. Just send it to BOND COMPETITION, PAGE 6, P.O. BOX 54, STAFFORD, ST16 1DR. Closing date is 17th December 1987.

COMPUTER GAMMON – BUGS SOLVED?

Dear PAGE 6,

Having read Dave Hitchens' plea for help in 'Computer Gammon – The Bugs', issue 29, I feel I may be able to shed some light on the problem.

Looking at the sample VBI code, there was no sign of a CLD instruction to set addition to binary mode. What was probably happening was that Basic was changing this mode continually thus causing inconsistent results from addition in the VBI code.

The solution to this is to save the processor status register flags at the start of the VBI and restore them before returning to Basic. You are then able to clear or set decimal mode within the VBI, as you require, without affecting Basic.

The VBI code might read as follows:

```
PHP        ;Save Flags to stack
CLD        ;Set binary mode
:
:          ; VBI code required.
:
PLP        ;Restore Flags
JMP EXIT ;Return from VBI
```

I hope this is of use to Dave, and if he specifies the problem with DLI's a little more precisely, I would be glad to try and figure it out.

Keith Mayhew
Rayleigh, Essex

MORE FOR CASSETTE

Dear Sir,

In the Letters page of Issue 27 you asked: 'Is there enough call for a cassette based version of Revision C?'.

There are still quite a number of us out here you know, who are solely cassette based! And it is annoying to find that so many listings are for disk only. Apart from the time factor, surely the only real value of a disk drive is its search facility which is rarely used on home machines.

I think that you should make a condition of acceptance that any program should be capable of storing on both disk and cassette. From the listings in your magazine it is obvious that the contributors are experts in their field capable of converting their program to both disk and cassette. Not so easy for the poor cassette based beginner.

D.E.Fogerty
Salisbury, Wilts.

Point taken. Wherever possible we try to ensure that programs accepted for publication are suitable for both cassette and disk but there are often cases where excellent programs, such as The 3-D Animator in this issue, are simply not suitable to run on cassette. This particular program reads in other sections of the program from a menu as required and also writes out individual files which are continually updated. This might just be possible with tape but it would be so cumbersome that I doubt whether anybody would actually be able to use the program successfully! We would not exclude a program from publication because it was written specifically for cassette and conversely feel that we should publish good programs even if they are only suitable for disk users. Don't be disappointed, you should find several programs in each issue which will run on cassette and next issue we'll put in that cassette based Revision C Basic!

DOS MYSTERY?

Dear PAGE 6,

A minor query regarding DOS 2.5.

I am constantly SAVEing programs, modifying, saving, etc. then deleting all the unwanted bits from the disk. Occasionally a program appears with a '<' at one end of the filename and a '>' at the other. What is the significance of these two arrowheads?

A. Golding
Barnet

These are nothing to worry about. They simply mean that either part of, or the whole of, a program is stored in sectors that are numbered greater than 707, the enhanced density feature. If you booted up with a DOS 2.0

SAME OLD STORY

Dear PAGE 6,

I have just returned home after three years abroad and am disappointed, yet not really surprised, to find that the plight of the 8-bit Atari User is as forlorn as it was when I left. The absence of any software on the shelves of the high street shops, even in London, is matched by the non-existent hardware. Sinclair, Commodore, Amstrad, etc., are everywhere but no Atari, though there is a smattering of ST's.

I tried to purchase a 1050 disk drive but was told, as was being reported in the press, that stocks had been sold out and a new double sided drive was expected soon at around £180. I also read that with the introduction of the Mega Ataris the basic ST is likely to be reduced in price whilst the XE is reportedly going up in price.

It is clear that the XE is being overlooked yet again, presumably because the ST range represents bigger profit margins. The 8-bit market is basically mail order only where overheads are less, therefore your reporting of the 'computer cowboys' is a valuable service, and I would like to relate to my own 'mail order cowboy' experiences.

Firstly, credit where it is due. I have found PAGE 6 to have the best public relations department I have experienced. Orders have been despatched promptly and queries always answered. This is not true of certain other publications whose organisation is appalling even if well meaning, or who do not bother to respond at all.

The worst English company I have dealt with has been 'Cut Price Software', from Harlow, who have had my money for ten months without responding to any of my letters. A solicitors letter elicited a response that I had not responded to any of their letters explaining the problems (I have heard that excuse before), and a promise to return my money, which they have not since done. I can accept that one letter may go astray in the post but not every one! I am currently taking them to court, however, they are no longer resident at their mailing address. 'Cut Price Software' are not the worst company I have dealt with however, that honour goes to 'White House Computer', in America who have had my money for two years! Though the story is complicated it is true to say that they have also ignored the considerable number of letters I have written to them with the exception of one. About a year ago I wrote a particularly rude letter questioning their parentage and they did write back. Guess what they said? Correct, they said I had not responded to any of their letters explaining their problems. Again a promise to return my money but no cheque. None of these errant



disk and requested a directory, the programs in the '< >' would not appear as DOS 2.0 uses single density only.

KILL THAT QUERY!

Dear Les,

I am writing a small program that needs quite a bit of input, and needless to say all those horrible question marks make the display rather untidy. Is there a way of inputting without the ?.

P. Resuirata
Baghdad

This is something that puzzled almost everybody for years and many people will still tell you that it is not possible to get rid of the question mark when prompting for user input without some complex programming. But it is possible! And it is easy! Just try the following lines

```
10 DIM A$(10)
20 ? "ENTER SOMETHING ";:INPUT #16,A$
30 ? A$
```

So just use INPUT #16 when you don't want the ? but don't ask me why!

---

companies actually claimed they had sent the software which of course was the crux of the matter. If anyone knows an American lawyer willing to take on an open and shut case then I have all the evidence!

If Atari is to survive particularly at the 'bottom/cheap' (8-bit) end of the market then companies handling their name have to be reputable and magazines like yours spread the good word. If there are too many Atari 'computer cowboys' then people are only going to buy computers where software and hardware are available off the shelf to minimise their risk.

I have been taking PAGE 6 from the first edition and have been impressed by its continuing to mature. I like the outspoken editorials, and reviews which give opinions I value, so more of the same please.

Ray Pinches
Teddington, Middx.

STOP THAT ST SCREEN

Dear Sir,

As I am new to the ST and computing in general would you answer me a question?

I have various demo disks that have a file called READ.ME. But when I load it to read, it whizzes down the screen and I don't get a chance to read it! Sometimes I have managed to stop it by pressing a key, but by then half of the message has disappeared! What do I press so it is still at the beginning and then what do you press to make it move up a screen at a time?

Patrick Olsen
York

The correct procedure for reading a text file on screen is to double click on the file and then select Show. If the file has been correctly stored on the disk the text should be shown one screen at a time, pausing each time with a 'More ...' message. Hitting Return will advance the text one line at a time and the space bar will scroll another full screen into view. If you wish to quit back to the desktop, just press Q. That's how it should work but problems can arise as the result of the file not being properly saved in the first place or being formatted for 80 column output and being read in low resolution which only has a 40 column screen. The solution to the latter is simple, just switch to medium resolution and Show the file again. If it has been properly printed and formatted in 80 columns you should have no problems in reading it. If you still get the same problem. the only answer is to load the file into a word processor like STWriter and then PRINT it to disk rather than SAVE it. If you also set the right margin to less than 40 you should be able to read the file in low-res as well.

VIDEO TITLES

Dear Les,

I have just purchased a Sony Video 8 Camera and have seen video magazines advertise 'titling' programs for Amstrad, Commodore etc., for adding titles to your video programs. Do you know of any program to do this for the Atari? Or is there anyone out there who has the 'know-how' to do it?

H. W. Clark
Barking, Essex

Several readers have asked this over the years and the good news is that Datasoft have just started advertising an Atari XL/XE version of their Video Title Shop program. Hopefully this will be released in the U.K. shortly through the licensing agreement with U.S. Gold but it should be available anyway from those specialist retailers who normally import American titles.

AIN'T WE GOOD ...

Dear Les,

Having received my latest copy of PAGE 6 I feel that I must express my amazement at the quality and value for money. I compared Issue 29 with Issue 1 and the improvement in the standard of the magazine itself, as well as the listings, is vast.

I say that the listings have improved but this is no criticism of the early programmers. Indeed, because of them (and of course PAGE 6) Atari enthusiasts world wide have learnt and developed their skills. I would also like to thank you for publishing screen shots of the listings.

May PAGE 6 continue to give help, encouragement and enjoyment for years to come.

Mr. A.J. Wright,
Ipswich, Suffolk

... SURE ARE!

Dear PAGE 6,

I am the newsletter editor and vice president of our local users group. We've received two issues of PAGE 6 as exchanges and to be quite honest, it is probably the best 8-bit Atari publication in existence. The type-in programs rival many commercial programs and the amount of information presented is excellent.

Thanks for an excellent magazine and if there is anything we can do for you here in the States, don't hesitate to ask.

Gordie Meyer,
Midwest Atari Group – Iowa Chapter,
Ames, Indiana, U.S.A.

Got anything interesting to talk about? Or some questions to ask? Or some tips to pass on? Write to Readers Write, PAGE 6, P.O. Box 54, Stafford ST16 1DR

No.19 GUNSLINGER

Garry Francis ventures as far as he could possibly go from his native Australia – to the Wild West where he discovers fact and fiction in an adventure ideally suited to beginners

North American history is a fascinating subject which is liberally sprinkled with potential scenarios for the budding Adventure writer. An imaginative author could draw from the diverse cultures of the various Indian tribes, their battles with the land and their battles with each other. These tribes included the Nez Perce, Shoshoni and Ute of the Rocky Mountains; the Assiniboin, Hidatsa and Mandan from near the Great Lakes; the nomadic Crow, Sioux, Arapaho, Cheyenne, Kiowa, Comanche and Apache of the Great Plains; the Osage, Shawnee, Cherokee, Seminole, Choctaw and Chickasaw of the south and dozens of others.

Following the Spanish invasion and the later expansion of the white man, there were numerous territorial conflicts such as those between the Spaniards and the Comanches in the south-west, the British, French and Provincials around the Great Lakes, the War of Independence, the War of 1812 and the Mexican War. Perhaps a more inspiring era for Adventures is that of the first great explorers such as Lewis and Clark, the mountain men such as Smith and Bridger, the early settlers (or sodbusters as they were known) and the horrors of the slave trade.

As the nation grew, it saw the emergence of the steamboat, the gold rush of 1849, the Stagecoach Age, the short-lived Pony Express, the Civil War, the construction of the great transcontinental railroads and the growth of the cattle industry which gave rise to the cowboy as a national figure. Then there's the Wild West!

The Wild West is usually taken to mean the trans-Mississippi West from 1865 to 1900. Strictly speaking, it wasn't as 'wild' as some of the earlier periods, but it had its fair share of violence and lawlessness. This is the period that is famous for outlaws, lawmen and vigilantes, gambling, gunfights and necktie parties which adorn the movies of Hollywood.

Despite the rich source of ideas, there are very few Adventures which take advantage of North America's colourful history. The only two that come to mind are Scott Adams' 'Ghost Town' (Adventure International) and Peter Kirsch's 'The Dalton Gang' (SoftSide Adventure of the Month). Now, at long last, Datasoft has come up with a new Adventure lifted straight out of Hollywood's Wild West.

THE REVIEW

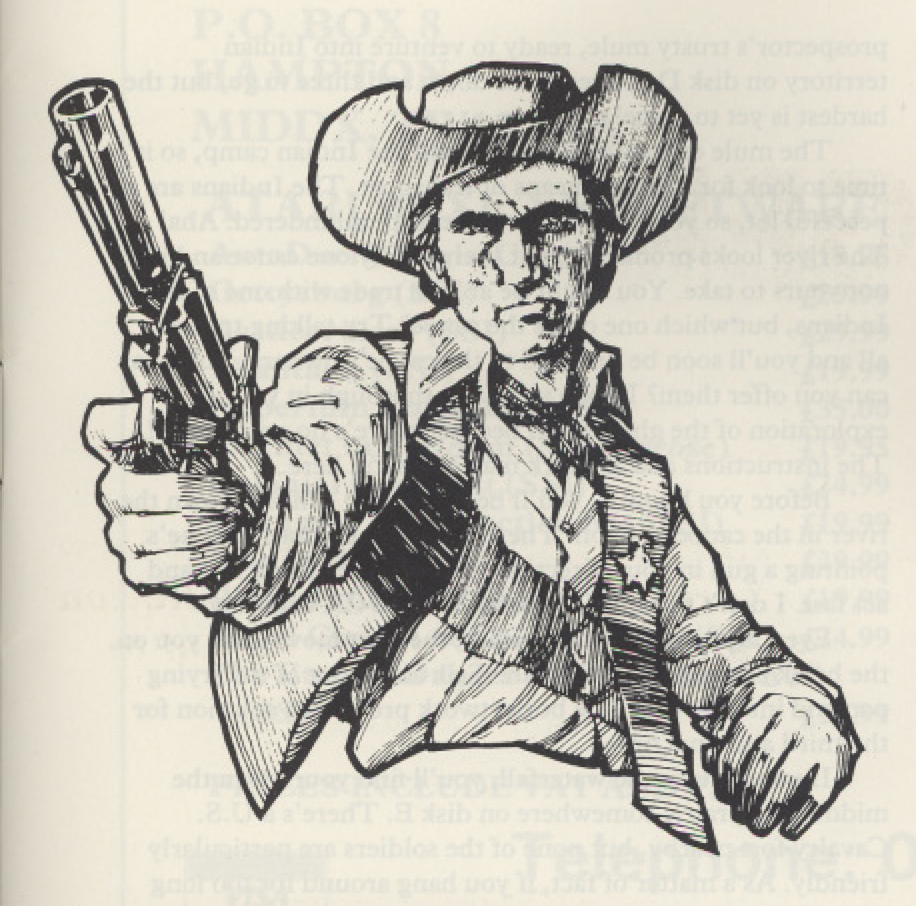
Gunslinger is an illustrated Adventure developed by Imagination Development Systems (whoever they are) and distributed in Australia by Intellicreations under the Datasoft label. U.S. Gold will be releasing a disk version in the U.K. in October so it should be widely available by the time you read this.

It would appear that Gunslinger was originally written for the Apple II. This is probably a good sign as Apple Adventures tend to be top notch. The game has since been translated for the Atari XL/XE and the Coldsore 64. The Atari version comes on three double-sided disks! That's a lot of Adventure!

In Gunslinger, you play the role of Kip Starr, a former Texas Ranger who has to rescue his old pal James Badland from the hangman's noose. *The Texas Rangers were raised when the Texas Revolution broke out in 1835 and were active until around 1890. They were famous for their courage, determination, endurance and leadership.*

HOLLYWOOD CLICHES

In your search for James, you will encounter all the Hollywood cliches that you can possibly imagine. There's everything from deserts, prairies and rivers to an underground mine, an Indian camp and a U.S. Cavalry fort. There's also three towns, each with a mixture of buildings lifted straight out of a John Wayne movie. There's a barber shop, a general store, a trading post, a stagecoach office, a blacksmith, a stable, banks, hotels, saloons, gaols and much more. Your transportation from place to place includes a mule, a horse, a canoe, a runaway mine car, a stagecoach and a train. Whew! But wait! There's also a crooked poker game, a fight on the roof of a train, three potential hangings (one is James' and two are yours!) and the inevitable gunfights. And while all this is going on, the six Dalton brothers are out to get you! *There are six Dalton brothers in the game, but only three are introduced by name – Jessie, Horace and Luke. The names are fictitious, although they may be inspired by famous gunmen of the period such as Jessie James and Luke Short. Horace is a mystery unless it is a corruption of Hoss. (What were the names of the three Cartwright brothers in Bonanza?) The selection of Dalton as a surname is unfortunate as it causes confusion with the real Daltons – Bob, Emmett and Gratton. The real Dalton brothers formed a gang in 1890 and were gunned down by the local townspeople when making the first attempt to rob two banks simultaneously at Coffeyville, Kansas in 1892. Only Emmett survived and he served 15 years in prison.*



SEVEN SCREEN WINDOWS

After you've booted the game and been through the obligatory titles, you get your first glimpse of the unusual screen layout. The screen is divided into seven windows. The three in the top left corner give you a brightly coloured picture of the current location, cute little pictures of any visible items and a one line description of the current location. The graphics are quite good.

The window at the bottom of the screen is where you type your commands and get the program's responses. The unusual part of the screen layout is the windows in the top right corner. The main one shows you a list of 13 verbs. You can use a joystick to move through the verbs until the one you want is highlighted, then press the joystick button and it appears in the bottom window just as though you had typed it from the keyboard. If the verb you want isn't shown, you can use the joystick to page up and down through the rest of the verbs. Once a verb is selected, the nouns appear automatically. This is followed by pronouns, then back to nouns. You can also view verbs, nouns and pronouns in a different order if you wish. You can terminate your command at any time by highlighting the 'CR' and pressing the joystick button.

One notable omission from the vocabulary is the compass directions which are normally used to move about in a game. Movement is achieved by placing the cursor in the bottom right hand corner of the picture of the current room. When you do, a compass appears. Highlight the direction you want to go and press the joystick button. Hey presto!

This whole concept is not new. I've seen it on ST games, but it's a novelty on 8-bit machines. Unfortunately, it is horribly slow and cumbersome to use. I don't think a normal person could use it for very long without going mad, but it may be of some use to disabled people who can use a joystick, but can't use a keyboard. The bottom line is that you can use keyboard only, joystick only or a combination of both. The choice is up to you.

EASY PUZZLES

After experimenting with all the controls, you can get into some serious Adventuring. You'll find that the game is quite pleasant to play. It has a small, yet adequate vocabulary and it always tells you when a word is not understood or if you're using it in the wrong sense. The puzzles are all relatively easy, but some require a hell of a lot of trial and error. These are usually situations where you die if you make a wrong move, so frequent game saving is the order of the day.

The game has a few minor bugs (don't they all!), but nothing really drastic. There were at least three situations where a word began with a lower case letter rather than upper case (or vice versa), but otherwise the spelling was excellent...providing you speak American! A few of the American spellings that cropped up were fiber instead of fibre, ax instead of axe, center instead of centre and jail instead of gaol. Also Goldy Locks should have been spelt Goldilocks and ok should really be O.K. or okay, but this is nit-picking. More important perhaps were the two occasions when the mule was called a donkey. Oh dear! The poor creature! *A mule is actually a cross-breed between a horse and an ass (or donkey, depending what country you live in) used as a beast of burden and is usually sterile.*

My only real complaint is a lack of coherence. When playing the game, I had an uncomfortable feeling about it, but I couldn't place my finger on it at the time. It was only while doing research for this article that I suddenly realised what was wrong. The authors have deliberately incorporated all the Hollywood Wild West cliches that they could possibly think of without giving any consideration to authenticity. As a result, we have a blend of fictitious characters using the names of real people, real events that have been distorted to fit a fictitious story, a dubious time scale and geography ranging from Canada to Mexico. This is a personal grudge and most people wouldn't even notice it, but it makes for interesting discussion. Some of the more interesting points are printed in italics throughout this article.

Overall, I thought Gunslinger was a thoroughly enjoyable game. It's fairly easy to play and would probably suit a beginner providing he or she exercised a little patience and saved the game frequently.

GAME PLAYING STRATEGY

The first location in Gunslinger has you stranded in the blazing hot desert beside your dead horse. Even before you've got time to read the caption, a lone horseman appears over the horizon and gives you a ride to Dawson City. It is here that your Adventure begins. *The only Dawson City that I know of is the one at the fork of the Klondike and Yukon Rivers in Canada's Yukon Territory. Dawson was the local boom town during the last great gold rush in the freezing winter of 1898 – not exactly a desert! If this assumption is true, then it sets the period at no earlier than 1898. This places it right at the end of the Wild West era, which fits in well with the rest of the game.*

Dawson is an interesting little town. It is full of colourful characters and all of them are willing to talk to you. You can get a trim and a shave at the barber shop, buy something to eat at the general store or take a shot of whiskey at the saloon.

→

Unfortunately, none of these actions are very helpful in getting you to Mexico to rescue James from the hangman's noose. It's a l-o-n-g walk from Canada to Mexico, so maybe you should find some transportation. If only you had enough money! What about trying your luck at the poker table? *The popularity of poker is a Hollywood myth. The most popular card games amongst frontier gamblers were actually Faro and Monte.*

Aha! Your first encounter with one of the Dalton brothers. Can you beat him at poker and live to tell the tale? The solution to this problem is typical of all the major puzzles in the game. You must do exactly the right thing at exactly the right time or you'll get killed. A lot of trial and error and careful timing is in order. You'll only find the correct sequence of moves by dying a few times, so make sure you save the game first. If you need a hint, check the instructions that came with the game and the excellent artwork on the packaging.

If you play your cards right at the poker table, you should find yourself with enough money to buy a stagecoach ticket. *The stagecoach seems a little out of place in the Yukon. Not only is the terrain unsuitable for stagecoaches, but the Stagecoach Age had come and gone by 1898.*

Unfortunately for you, your trip is not without incident. True to Hollywood style, the stagecoach is attacked by bandits and you are shot before you reach your destination in Carson City, Nevada. When you awake, you find yourself in a dried out riverbed on side B of the disk. Your wounds have miraculously healed, but all your belongings are gone. You are probably somewhere in California, for there is an old Spanish well and an abandoned mining town nearby. The town's only inhabitant is a weather-beaten old prospector who owns a sluice box and a mule. The sluice box could come in handy, but it's the mule that attracts your attention. After all, it's still a long way to Mexico!

Unfortunately, the grizzled old prospector is not about to relinquish his precious belongings, at least not unless you've got something valuable to offer. Perhaps a search of the town is in order.

The town contains a range of deserted buildings and a few seemingly useless objects, but nothing to offer the old prospector. If you follow the road north out of the town, you'll discover a sealed mine entrance, but try as you may, you can't get in. If all seems lost, go to the other end of the town and give some thought to this... When is a dry river bed not a dry river bed? The answer is crystal clear. I'm damn sure of it.

Entering the mine takes you to disk C. I'd suggest you ignore the mine car for the moment and explore everything else first. You should find a few useful objects including something that may interest the old prospector. When you're satisfied that you've been everywhere, hop in the mine car for the ride of your life. Actually 'life' may not be quite the right word to use! This is another situation where you will probably get killed off a lot while trying to find the right combination of moves.

If you survive the mine car incident, you'll soon find yourself on a ledge overlooking the ghost town at one end and an Indian camp at the other. The Indian camp is inaccessible at the moment, but at least you know where to head next. In the meantime, it's back to the ghost town to barter with the old prospector.

Darn it! He still won't part with his mule. You'll have to find something more valuable. But what? Diamonds? Silver? Gold? Gold! Of course! A little prospecting and a little more trading and you should find yourself mounted on the prospector's trusty mule, ready to venture into Indian territory on disk D. Three disks down and three to go, but the hardest is yet to come!

The mule cannot take you beyond the Indian camp, so it's time to look for another means of transport. The Indians are a peaceful lot, so you can explore the camp unhindered. Aha! The river looks promising, but there's only one canoe and it's not yours to take. You might be able to trade with one of the Indians, but which one owns the canoe? Try talking to them all and you'll soon be directed to the canoe's owners. But what can you offer them? I hope you were thorough in your exploration of the ghost town because there's no going back! The instructions and artwork may be useful here.

Before you know it, you'll be peacefully drifting down the river in the canoe. Oh, oh! There's Horace Dalton! And he's pointing a gun in your direction. You'd better think fast and act fast. I don't think he's here for the DUCK shooting!

Even if you avoid getting shot, the next move finds you on the brink of a waterfall. Sheesh! Talk about out of the frying pan and into the fire! The box artwork provides a solution for the third and final time.

If you survive the waterfall, you'll find yourself in the middle of a prairie somewhere on disk E. There's a U.S. Cavalry fort nearby, but none of the soldiers are particularly friendly. As a matter of fact, if you hang around for too long they throw you in the stockade for conspiring with the Indians. After 4 moves, the guard peeks in and gives you your last meal. Things don't look real promising! After 12 moves, the guard gives you a cigarette and after 20 moves, you get dragged off to the gallows. (I knew smoking was a health hazard, but this is ridiculous.)

When you're first thrown in the stockade, all your belongings are taken except for what you're wearing. It's possible to escape from the stockade, but you must do so with only the items you find after your imprisonment. Timing is also important. If the guard bursts in at the wrong time, you'll be killed straight away. If you break out too early, you could miss out on an important item.

If you manage to escape, you'll find yourself on top of the fort's wall. However, the alarm has been raised and soldiers are closing in from all directions. The only escape route is down, but it's too far to jump and survive the fall. Did you explore the fort before you were captured? If not, restore a saved game and go back to the warehouse. Here you'll find an item which may help your escape attempt. All you've got to do is to somehow smuggle it into the stockade without it being taken from you!

After you escape from the fort, the soldiers continue to close in on you. The only way to escape them is to burn your bridges behind you (so to speak) and run like blazes. If you don't waste any moves and you don't run straight into the soldiers' arms, you'll get a chance to jump aboard a moving train before the soldiers can catch up.

Even if you make it to the train, there's no time to rest. Seconds later, the train comes to a screeching halt and the bouncer searches the boxcars to make sure there's no freeloaders. If you hang around, the bouncer will surely find you and beat your brains out with his billy club. The only alternative is to try and hide, but this brings you face to face with Luke Dalton. Not much of an alternative is it? Timing is crucial once again, but if you can survive the encounter with Luke, you finally get a chance to rest.

Hours later, the train pulls in to the station at Tijuana.

Tijuana is on the west coast of Mexico, immediately south of the border with the U.S.A. It is here that James Badland is to hang.

Leaving the train takes you to disk F. From the train station it is a short walk through the desert to the streets of Tijuana. A quick exploration of Tijuana reveals its Spanish influence including an archway, a cantina, a cathedral, the El Banco Nacional and the local lockup where James is imprisoned. If your attempt to rescue James is to succeed, you're going to need a lot of careful planning and, of course, the usual experimentation and game saving helps. I'd suggest you pay James a visit and have a talk to him before you try anything. This at least gives you access to his horse and rifle.

When the bell starts ringing, you know that the end is near. James is taken to the gallows and a crowd gathers near the central plaza. When the bell stops ringing, James will be hung. Timing is crucial. You have to save James before the bell stops ringing. Maybe you could position yourself somewhere that gives you a good view of the gallows and use your Texas Ranger marksmanship to cheat the hangman of his quarry. (Just be careful not to shoot James.) The bloodthirsty mob will not take kindly to this move and you'll have to act fast to ensure your own escape. The secret is to have everything planned in advance.

The very last move of the game turns out to be a real disappointment as the program takes over and everything happens automatically. In one move you save your own skin, snatch James from the gallows and together you ride out of town.

The game should end at that point, but it pushes the friendship by extending the automatic scenario so that after a two day ride, you and James find yourselves at the O.K. Corral in Tombstone, Arizona. The game finally ends as you gun down the three remaining Dalton brothers (despite the fact that you have only one rifle between you!). *The shootout at the O.K. Corral is the most notorious in the history of the Wild West. It occurred in October 1881 when Virgil, Wyatt and Morgan Earp and a gambler friend known as Doc Holliday (from his profession as a dentist) exchanged gunfire with four local cowboys, Ike and Billy Clanton and Frank and Tom McLaury. Virgil and Morgan Earp and Doc Holliday were wounded during the foray. Billy Clanton and both the McLaury brothers were killed. Only Wyatt Earp and Ike Clanton escaped unscathed.*

NEXT ISSUE

Well, so much for Gunslinger. Next issue promises to be another interesting one. If all goes well, I'll be taking a look at The Neverending Story – the book, the movie, the Adventure. I've been looking forward to this one for a long time. See you then.

Garry Francis
26 Baringa Road,
Earlwood,
N.S.W. 2206
Australia

TURBO BASIC

More Graphics

by Gordon Cameron

One of the advantages of Turbo Basic is its speed. You can achieve great demos which would not be at all effective in Atari Basic. This one from Gordon Cameron uses colour cycling to achieve a fine animated effect and is a good example of how the structure of Turbo Basic can be very different from ordinary Atari Basic.

Take a look at how procedures are defined for the three main parts of the program and the use of unique Turbo commands such as DO, LOOP and REPEAT within the PROCedures. Another feature is the use of labels in certain lines. Check line 1550 which draws a border around the screen, for a good example of how a program can be more easily understood. What could be easier when drawing a border than saying go along, down, back and up? One thing that Gordon did not do was to renumber the program. One of the reasons for having labels and being able to GOTO a label is that a program can be renumbered without having to worry about whether variables have been used for line numbers.

```
QK 1 REM ******************************
FV 2 REM *      TURBO-BASIC DEMO      *
AK 3 REM *        by G.Cameron        *
DY 4 REM *----------------------------*
KX 5 REM * PAGE 6 MAGAZINE - ENGLAND *
QP 6 REM ******************************
NM 7 REM
QR 9 X=40:Y=94:Z=38:C=4:CONST=94
SF 10 EXEC DRAW_CIRCLES
OZ 15 EXEC DRAW_BORDER
QA 20 EXEC ROTATE_COLOURS
YR 30 END
HZ 40 ----------------------------
CX 1000 PROC DRAW_CIRCLES
YN 1010   GRAPHICS 10
JD 1020   FOR A=0 TO 4:SETCOLOR A,0,0:NEX
    T A
MB 1035   DO
FP 1038     COLOR C:COUNT=Z-C
RQ 1040     DO
XT 1050       CIRCLE X,Y,COUNT,CONST
FW 1055       COUNT=COUNT-5
XM 1060       IF COUNT<0 THEN EXIT
TN 1070     LOOP
NK 1080     C=C+1:IF C=9 THEN EXIT
BI 1085   LOOP
MH 1090   COLOR 4:PLOT X,0:DRAWTO X,188
AV 1095   FOR C=10 TO 1 STEP -1
JZ 1100     COLOR (C/2)+3:CIRCLE X,Y,34,C
    +10
ZB 1105   NEXT C
YH 1110 ENDPROC
XK 1120 ----------------------------
UF 1500 PROC DRAW_BORDER
FK 1510   X=4:Y=0:C=4:FLAG=1:PLOT X,Y
LO 1520   DO
NY 1530     COLOR C
TU 1550     ON FLAG GO# ALONG,DOWN,BACK,U
    P
UI 1552     EXIT
LU 1555     # MARK
TN 1557     DRAWTO X,Y
MX 1560     C=C+1:IF C=9 THEN C=4
AV 1570   LOOP
ZK 1580 ENDPROC
YN 1590 ----------------------------
CH 1600 # ALONG
VH 1602 X=X+2:IF X>=75 THEN GO# FINISHED
JS 1604 GO# MARK
AR 1610 # DOWN
FK 1612 Y=Y+4:IF Y>=188 THEN GO# FINISHED
JV 1614 GO# MARK
MJ 1620 # BACK
NE 1622 X=X-2:IF X<=4 THEN GO# FINISHED
JY 1624 GO# MARK
SA 1630 # UP
MK 1632 Y=Y-4:IF Y<=0 THEN GO# FINISHED
KB 1634 GO# MARK
YV 1636 ----------------------------
OR 1640 # FINISHED
JK 1645 FLAG=FLAG+1
JR 1650 GO# MARK
YX 1655 ----------------------------
PS 2000 PROC ROTATE_COLOURS
LC 2010   DO
MO 2020     CYCLE=4
RP 2030     REPEAT
CA 2040       COLNO=0
AF 2050       REPEAT
KM 2060         LUM=(COLNO+CYCLE)*2+6
VG 2070         IF LUM>14 THEN LUM=LUM-10
WO 2080         SETCOLOR COLNO,1,LUM
DX 2090         COLNO=COLNO+1
OC 2100       UNTIL COLNO>4
RU 2105       CYCLE=CYCLE-1
HR 2110     UNTIL CYCLE<0
MY 2115     KEY=(PEEK(53279)<>7)
AI 2116     IF KEY THEN EXIT
ZZ 2120   LOOP
YO 2130 ENDPROC
XR 2140 ----------------------------
```

YOU CAN DO THIS!

So there's another example of Turbo programming. Can you do better? We'll pay you £20 for a good example of Turbo programming. It must use the features unique to Turbo and be well structured and it must fit on one page. Please also include a brief explanation of the program. Anything will do, but try and make it different!

WHAT IS TURBO BASIC?

Turbo Basic is a new Basic language for the Atari originally published in the German magazine Happy Computing who retain the copyright but have released the program to the public domain. It adds over 60 new commands to Atari Basic, runs three to five times as fast, is totally compatible with Atari Basic and comes with a compiler to compile any Atari BAsic or Turbo Basic program to run at machine language speed. You should be able to get a copy from any source of Public Domain software such as your local user group or the PAGE 6 Accessory Shop.

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3. HIGH SCORE SAVE

by Ian Finlayson

In the third of our Tutorial Subroutines Ian Finlayson provides a means of saving high scores in your program – not just for one game but as part of the actual program

Many games for your computer have a high score feature to ensure you play again and again to try an improve on your previous performance, but few games will remember your high score from one playing session to the next. The subroutines which follow will allow you to add a high score save feature to any Basic game. Before going any further I must first sound a warning – as the subroutines will write to your tape or disk do not add them to your original program, work on a copy!

FORCED READ MODE

The technique used is called 'Forced read' and is a very powerful feature of 8 bit Atari computers which allows a program to modify itself by automatically writing program lines on the screen and then reading them as if they were typed in manually. The forced read mode is used here to change line 31210 so that the variable TT7 is set equal to the highscore of your completed game. In a more complex application one of the early graphics programs for the Atari called Drawpic used this technique to store pictures by first transforming the screen data into ATASCII characters in a long string and then adding the string to the program by using forced read.

THE SUBROUTINES

Two subroutines are required for the high score save. The first is very short, only two lines – 31210 is the line which will be modified and 31220 will set HIGHSCORE equal to the saved variable at the beginning of a game. You will have to change the variable name that I have called HIGHSCORE to the name that is used to store the high score value in your game program.

The second subroutine is the one which rewrites line 31210. As this also saves the game I have included versions for tape and disk. Keep line 31270 for use with disks or alternatively delete line 31270 and remove the REM from lines 31280 and 31290 for cassette use.

SUBROUTINE ANALYSIS

The first subroutine requires no explanation but I will expand on the second. When we call this subroutine game play is over and we wish to save the game complete with the new high score.

Line 31230 - In this line we check to see if the new high score (HIGHSCORE) is better than that saved last time (TT7). If it is not there is no need to save it and the subroutine returns immediately to the main program.
Line 31240 - First select Graphics 0 to allow the required text to be written to the screen. This is necessary as most games will be in other graphics modes. Then move the cursor down three lines and print line 31210 showing the variable TT7 equal to the new value of HIGHSCORE.
Line 31250 - Move the cursor down again and print "CONT"
Line 31260 - Put the cursor back to the top of the screen. Poke 842 with the value 13 to enable forced read mode and STOP the program to start the forced read. At this point the computer will scan the screen and implement what is there; so it will read the new line 31210, including it in the program, and then read the CONT command which restarts the program at line 31270. If you use this technique in your own programs remember to leave a blank line or two before the "CONT" statement or the forced read will sometimes skip over it and go into an endless read which can only be stopped with the RESET key.

Remember also that the program will restart at the line after the line where it stopped; any further statements after STOP in this line would be missed.
Line 31270 - POKEing 842 with 12 disables forced read, otherwise the computer will try to read the screen again next time the program is stopped (e.g. at the end, after the game save). Next we save the game back to disk complete with the new line 31210 and high score value.
Line 31280/90 - These lines replace 31270 for cassette users. I have included a prompt to rewind the cassette as this is often forgotten when your game is loaded initially.

If you do not want to return to the main program to finally exit the game then replace RETURN in line 31270 or 31290 with END.

USING THE SUBROUTINE

To use the high score save you will have to add two subroutine calls to your game program. The first will be GOSUB 31200 which must be in the initialisation sequence of your game. If your game program contains a statement which gives an initial value to your HIGHSCORE variable this GOSUB should replace it. The second will be GOSUB 31230 and this should be near the end of your program after a prompt such as "PLAY AGAIN? (Y/N)" so that you only

```
NK 31199 REM **        PAGE 6          **
             **  SUBROUTINE TUTORIAL  **
             **    SAVE HIGH SCORES    **
TS 31200 REM ***************************
             ** FIRST TO GET HIGHSCORE**
             ***************************
QY 31210 TT7=0
BC 31220 HIGHSCORE=TT7:RETURN
WH 31229 REM ***************************
             **    REWRITE LINE 31210  **
             ***************************
LI 31230 IF HIGHSCORE<=TT7 THEN RETURN
DV 31240 GRAPHICS 0:? :? :? "31210 TT7=";
   HIGHSCORE
IM 31250 ? :? :? "CONT"
WK 31260 POSITION 2,0:POKE 842,13:STOP
ID 31270 POKE 842,12:SAVE "D:GAME":RETURN
HO 31280 POKE 842,12:? "↖↓↓↓REWIND TAPE":
   ? :? "PRESS RECORD PLAY AND THEN RETUR
   N":? :? "TO SAVE GAME AND HIGH SCORE"
YN 31290 REM CSAVE:RETURN
```

save the game and highscore when you have finished playing and not after each game.

ALTERNATIVE HIGHSCORE SAVES

You can try other ways of saving your high score value. This is quite easy to do with the direct file access of disks, but the problem is greater with cassette tape because of the sequential nature of records. One way of shortening the time to save the high score would be to LIST "C:",31210. This would save only the line which has just been rewritten. You can then use forced read for an ENTER C: command near the beginning of your program and the whole will run automatically, but there will be a problem repositioning the tape to the end of the main game program after ENTERing line 31210 at the beginning of the game and before the LIST "C:",31210 at end of play.

I would be pleased to hear from anyone who develops further useful subroutines from those in this series, and from anyone who would like a particular topic addressed in these articles. If you want a personal reply please enclose a stamped envelope and I will try to write back. My address is **Ian Finlayson, 60 Roundstone Crescent, East Preston, West Sussex BN16 1DQ.** •

THE CASTLE OF CIRE-NAMPAHC

A 100% machine code adventure by Eric Chapman

To celebrate our fifth birthday issue, the Disk for this Issue will have a special bonus on the reverse side – a 100% machine code adventure that is too long to fit in the magazine. Remember this program is only available on the Disk for Issue 30. Disk subscribers will receive their copy automatically but you can purchase the disk separately for just £3.95. Send £3.95 to PAGE 6, P.O. BOX 54, STAFFORD, ST16 1DR and the Disk with all the programs from this issue AND the bonus adventure will be on its way to you.

THE ADVENTURE

'The Castle of Cire-Nampahc' is a text adventure in the traditional style. It contains a large number of locations, numerous objects to be manipulated, and an extensive vocabulary.

The primary object of the game is to escape from the castle. A secondary objective is to gain the maximum number of points (1000) in doing so. Points are awarded for discovering valuable objects and eventually transporting them outside the castle. Points are also gained for overcoming obstacles and for reaching certain strategic situations.

The castle is not without its dangers of course, and though these are not likely to be immediately fatal it is not advisable to collect too many bumps and grazes. All of the dangerous situations can be overcome by logical means, albeit slightly tongue-in-cheek at times.

PLAYING THE GAME

At each stage you will be presented with a description of the location, followed by the request 'What shall I do?'. Type a one or two word command, followed by RETURN. If the command is recognised it will be actioned and an appropriate response given. If the command is not understood you will be told so. You can type more than two words if you wish, if so, the first two words which are in the program's vocabulary will be taken to be the command. For example, 'FOR PETE'S SAKE GET THE WRETCHED LAMP!' would be understood as 'GET LAMP'.

Movement commands can be entered merely by the initial letter of the direction, i.e. N(orth), S(outh), E(ast), W(est), U(p) and D(own). These commands can also be entered in full if you wish. Other useful commands are:-

INVENTORY – list the objects carried
SCORE – print the current score
LOOK – describe the current location
SAVE GAME – save the current status for future retrieval
RESTORE GAME – restore a previously saved position.

USEFUL HINTS

To solve the adventure you will almost certainly need to make a map. Remember that passages can twist and turn, so that a move in the opposite direction to your previous move will not necessarily take you back where you came from. However there is no magic or other inconsistency in the game, so it can be solved entirely by logic.

Watch out for clues which are given from time to time. These are usually not obvious, but if you think about the reasons for some of the statements, or the objects which are present, you may get some ideas for making progress. If a command is not understood, it may be worth rephrasing it.

If you get stuck it is probably best to save your current position and leave the game for another day. It is fairly difficult to solve, so you will not complete it in one sitting anyway. Depending on your experience and perseverance, it will probably take several weeks or even months.

Remember, THE CASTLE OF CIRE NAMPAHC is only available on PAGE 6 Issue 30 Disk.

LETTER CASTLE

Hidden on various floors of an old castle are letter puzzles which you must solve to get to the top of the castle. Peter Ohlmeyer provides an original, thought-provoking, puzzle game that will challenge you for hours

Letter Castle is what I would consider to be somewhere in between a game and educational software and the aim of it is quite simple. You are in 'The Cellar' of the old Letter Castle and have to move all the way to 'The Roof Garden'. This would be really simple if there was not a problem with the staircases. It is, of course, a very old castle and unfortunately most of the steps leading up have been destroyed during centuries of weathering, so to reach each floor you have to rebuild the stairs.

All the steps required to rebuild the stairs are still there, but you cannot hang them up in the air, they have to be supported by something. Unfortunately you will not find any suitable construction materials for this task, however since you are in a 'Letter Castle' you could most probably make use of the letters that are hidden in each floor of the castle. You have to find them, bring them to the staircase and place them in suitable places under the stairs. Why these places have to be suitable will be explained. It has something to do with the fact that the letters are not just magic letters to fix the staircase but also have to have a meaning. Once you have built up a complete staircase you can move to the next floor where you will face the same problems. The weathering, you know!

Finally you will reach the top floor, unless you gave up before, and then you will know how fast and clever you were in constructing the stairs.

This is all I have to tell you about the aim of Letter Castle. Now I have to tell you how to play it.

HOW TO PLAY

I assume that the description given above was so promising that you will undertake the formidable task of typing in the long listing. Before you start, have a look at the large number of 'nonsense' DATA lines at the end of the listing and make sure that you are using TYPO 3 to check your work! You are lucky, I could not use it when developing the program and the DATA lines! Quite frankly, I typed in the normal words and had a conversion subroutine do the job, otherwise I would still be busy correcting these DATA lines!

Once you have typed in the listing and have checked it with TYPO 3, save a copy to disk or tape and the RUN it. The title screen will appear and as the program initialises the screen will change. After a short while you will see a short explanation of the game and you are asked to choose from

1. CITIES
2. STATES
3. SPORTS
4. ANIMALS
5. PEOPLE

Your choice will determine whether the letters required to reconstruct the stairs finally form a city or state, an animal name or a celebrity. There is something particular about the names of people. They may either be only the surname or a combination of the first name and the surname. In the latter case, no 'space step' is left between the names, e.g. Henry Moore would read HENRYMOORE when building new steps.

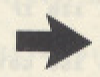
Your choice is made by pressing the appropriate number key and then play will commence. A screen will be drawn named THE CELLAR. You will see walls, stairs, an arrow and an information line at the bottom that displays from the left to right: the subject of your choice, the time left for stair construction, the letter you are actually carrying (once you have chosen one) and your actual score.

PRACTICE FIRST

Before you start to play seriously it is wise to have a practice run to familiarise yourself with the layout and objectives. You will find a funny little creature waiting to be moved with your joystick plugged into port one. Move him by pushing the joystick into the desired direction. You will not see any letters at first but passing over a letter field makes the letter automatically appear. When a letter appears you have two possibilities. You may either leave the letter untouched and move around to search for more letters or you can decide that you want to use the letter for the construction of the stairs. If so, move the little man over the letter and push the fire button on the joystick. You hear a beep and the letter changes its colour to let you know when you return to the floor that you have already taken it.

Once you have chosen a letter you must carry it to the staircase. Move the little man over the arrow and 'THE STAIRS' will appear on the screen. Let's first try the ladders. Move up and touch the arrow in the top left corner. This will allow you to 'Give Up' the puzzle you are working on by pushing the fire button with the little man placed on the arrow. Your score is reduced by 200 and you will proceed to

```
EI 1 REM ******************************
YY 2 REM *       LETTER CASTLE        *
IA 3 REM *    by PETER OHLMEYER       *
JO 4 REM *      AMMAN, JORDAN         *
EC 5 REM * -------------------------- *
IZ 6 REM *  PAGE 6 MAGAZINE - ENGLAND *
EO 7 REM ******************************
MN 8 REM
NS 10 N1=1:N2=2:N3=3:N4=4:N5=5:N6=6:N7=7:
   N8=8:N9=9:N10=10:N11=11:N12=12:N13=13:
   N14=14:N15=15:N16=16:N17=17:N18=18
PZ 20 N19=19:N20=20:N21=21:N32=32:N48=48:
   GOTO 2130
LX 30 REM *** MOVE IN FLOORS ***
IL 40 GOSUB 130:LOCATE (X-N48)/N8,(Y-N32)
   /N8,ZZ:IF ZZ=96 THEN GOSUB 1380
AK 50 IF ZZ>96 AND ZZ<123 THEN POSITION (
   X-N48)/N8,(Y-N32)/N8:? #N6;CHR$(ZZ+128
   ):GOTO 100
XT 60 IF ZZ<>N32 AND ZZ<>173 AND ZZ<>187
   AND ZZ<225 THEN X=X-DX:Y=Y-DY:GOTO 100
VA 70 IF LC THEN 90
NH 80 IF ZZ>224 THEN IF STRIG(N0)=N0 THEN
    110
JH 90 IF ZZ=173 OR ZZ=187 THEN AA=N0:GOTO
    1060
NJ 100 GOSUB 150:GOTO 40
PS 110 POSITION (X-N48)/N8,(Y-N32)/N8:? #
   N6;CHR$(ZZ-N32):GOSUB 190:POSITION N12
   ,N21:? #N6;CHR$(ZZ):SC=SC-N10
CR 120 LC=N1:GOSUB 1470:GOSUB 140:GOTO 40
```



the next floor. Sometimes it is wiser to give up because if the time runs out you will proceed to the next floor but your score will be reduced by 250.

Now go back down the ladders to where you came onto the screen and move straight to the right. You will reach the edge of the wall and just fall down. The only consequence is that you reduce your score by 50 points. You may choose this possibility for speed or use the downward ladder to reach the paths underneath the triangles marking the step positions. Assuming you are carrying a letter, move the little man under the triangle where you want the letter to be placed and push the fire button. The step falls into its proper position and is held by the letter.

GET SOME MORE LETTERS

To collect more letters you leave THE STAIRS by moving over the arrow in the right corner. Now pick up a new letter and repeat the procedure of placing it in empty positions of the stairs. Once you have placed a number of letters you can check whether they belong to the puzzle word or not. Climb up the steps and the correct letters will change colour whereas letters not required will disappear and the triangles will replace them again. Upon returning to the floor screen, the correct letters are now shown underneath the floor's name.

It should be explained that 'correct' only means that you need the letter to solve the puzzle, it does not necessarily mean that the letters are already in their proper positions.

Let us return to the floor screen and have a closer look at it. After placing a few letters you have to continue to find the letters and carry them to the staircase. I forgot to mention that only on the first two floors can you reach all rooms to collect letters. In the following two floors, one part of the castle is locked and you have to find the key first that will open the door. In the two remaining floors you have to find two keys before you can reach all the letters available. Each floor holds 20 letters of which you need only 8 to 10 to solve a puzzle but once a letter has been checked correct and the same letter appears in another location on the floor you are highly advised to take it because it is definitely in the puzzle word.

IS IT RIGHT?

Now let's go back to THE STAIRS. If you have managed to place letters in all the free places in the staircase, climb up the steps and check whether the door to the next floor will open. As you climb, correct letters will stay in their places while letters not required will disappear and the triangles will fall down again to indicate where new letters have to be placed. It is essential that you go all the way up to the steps in front of the door because if you return before you have reached the upper step, the triangles will remain in their position and you cannot place new letters.

SOLVE THE PUZZLE

Once you have found all the letters of the puzzle and checked them to be correct, you still have to check whether they are in the proper positions. Once all the letters are correct, a new ladder will appear and you are asked to 'CHECK'. Climb the new ladder until you reach the 'Y' before you start checking and then return to the stairs and go up until you reach the door. Letters that are already in the right position will change colour. It is your task now to change the positions of the other letters. Simply move underneath the stairs and place the little figure under the letter you want to place elsewhere. Push the button and move to the location where you want to place the letter. Push the button again and the two letters will fall down and change their positions. Just move the little man and the letters will automatically be placed in the new locations. Repeat this procedure until the letters under the steps make sense when read from left to right. It is wise to examine the letters carefully before starting the exchange procedure, because every exchange will reduce your score. You may check any time how many letters are in their proper positions by simply moving up the stairs again.

Once you think you have found the correct answer climb the stairs again and you will find that the door to the next floor will open upon reaching it, otherwise you will see a 'SORRY' message and you will have to change some more letter positions.

Having successfully solved six puzzles you will reach 'THE ROOF GARDEN' where your final score will be shown and you will be asked whether you are want to try another puzzle. A 'Y' would be fine.

HAVE FUN!

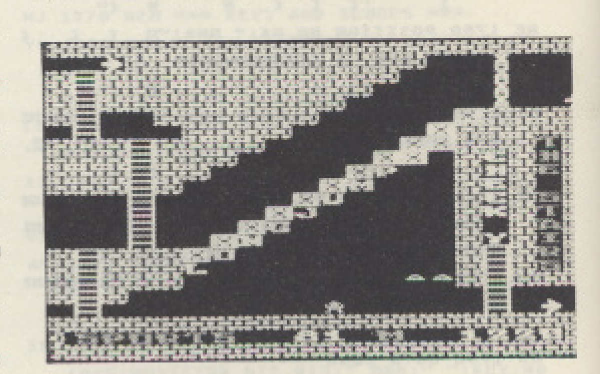
There are many puzzles in the Letter Castle and you will find yourself busy for many hours. I hope that I have managed to combine the right elements of gaming and education and that The letter Castle will continue to challenge and puzzle you.

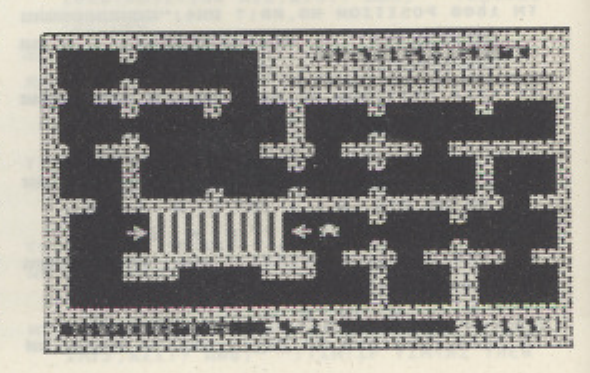
Dr. Peter Ohlmeyer is of German nationality and works in the German Embassy in Amman, Jordan. He has had several other excellent programs published previously in PAGE 6 but now, sadly, seems to have departed the 8-bit world for the ST.

```
OB 130 ST=STICK(N0):DX=(ST=N7)*N8-(ST=N11
   )*N8:DY=(ST=N13)*N8-(ST=N14)*N8:X=X+DX
   :Y=Y+DY:RETURN
GG 140 POKE 89,STAIRS:POSITION N12,N21:?
   #N6;CHR$(ZZ):TL=ZZ:POKE 89,SCREEN:RETU
   RN
TZ 150 TC=TC+N1:POS=PN:IF ST=N11 THEN POS
   =PL:GOTO 180
ON 160 IF ST=N7 THEN POS=PR
IG 170 IF TC>49 THEN TC=N0:GOSUB 1490
KT 180 Q=USR(MOVE,N0,PMB,POS,X,Y,N7):RETU
   RN
GQ 190 SOUND N0,30,N10,N14:FOR I=N1 TO N2
   0:NEXT I:SOUND N0,N0,N0,N0:RETURN
EO 200 REM *** MOVE ON STAIRS ***
EH 210 LOCATE (X-N48)/N8,(Y-N32)/N8,ZZ:LO
   CATE (X-N48)/N8,(Y-24)/N8,ZY:GOSUB 130
   :IF X<N48 THEN X=N48:GOTO 290
QH 220 IF ZZ=96 THEN GOSUB 1380
KM 230 IF X>80 THEN IF Y=184 AND X<168 TH
   EN 430
WV 240 IF ZZ=87 THEN CHK=N1:IF PUZ THEN P
   UZ=N0:GOSUB 1040
FT 250 IF X=88 AND Y=80 THEN X=X-DX:Y=Y-D
   Y:GOTO 210
TA 260 IF (ZZ+ZY)=67 THEN Y=Y-DY:GOTO 300
LO 270 IF (ZZ+ZY)=220 THEN IF ST=N14 THEN
    Y=Y-DY:GOTO 300
ML 280 IF (ZZ+ZY)=223 THEN IF ST=N13 THEN
    Y=Y-DY:GOTO 300
VV 290 IF (ZZ+ZY)=376 THEN X=X-DX
BL 300 GOSUB 150:LOCATE (X-N48)/N8,(Y-24)
   /N8,ZX:IF ZX=N32 THEN SC=SC-50:GOSUB 1
   470:GOTO 360
CQ 310 IF ZZ=173 AND X<120 THEN 390
EZ 320 IF ZZ=173 THEN AA=N1:GOTO 1060
RP 330 IF ZX=191 AND CHK=N1 THEN 870
VN 340 IF ZX=191 THEN 580
MN 350 GOTO 210
PV 360 Y=Y+N2:POS=PN:SOUND N0,Y-50,N14,N1
   0:POS=PN:GOSUB 180:LOCATE (X-N48)/N8,I
   NT((Y-24)/N8),ZX
CR 370 IF ZX=35 THEN SOUND N0,N0,N0,N0:GO
   TO 210
PG 380 GOTO 360
XY 390 POSITION N3,N1:? #N6;" eqtc sn":IF
    STRIG(N0)=N0 THEN SC=SC-250:GOSUB 147
   0:GOTO 410
ME 400 GOTO 210
HQ 410 POKE 559,N0:POSITION N3,N1:? #N6;"
   ############":GOTO 990
MN 420 REM *** PLACE LETTERS ***
TK 430 GOSUB 710:GOSUB 150:IF LG=N10-LS A
   ND TON=N0 THEN 730
TH 440 IF SOL THEN 750
GE 450 IF STRIG(N0) THEN 430
VA 460 IF LC=N0 THEN 430
PB 470 LOCATE PP,LL(PP),ZZ:IF ZZ<>N32 THE
   N 430
FA 480 POSITION PP,LL(PP):? #N6;CHR$(TL):
   GOSUB 510:POSITION PP,N17:? #N6;" "
OH 490 FOR I=LL(PP)-N6 TO LL(PP)-N2:POSIT
   ION PP,I:? #N6;" ":POSITION PP,I+N1:?
   #N6;"■":GOSUB 520:NEXT I
AU 500 SOUND N0,N0,N0,N0:LC=N0:GOTO 430
BW 510 SOUND N0,150,N10,N10:RETURN
ZN 520 SOUND N1,30,N14,N8:SOUND N1,N0,N0,
   N0:RETURN
ME 530 REM *** LETTER CORRECT? ***
IN 540 ST=STICK(N0):DX=(ST=N7)*N8-(ST=N11
   )*N8:DY=(ST=N11)*N8-(ST=N7)*N8:X=X+DX:
   Y=Y+DY:POS=PL:IF ST=N7 THEN POS=PR
NJ 550 IF X>168 THEN 540
IG 560 IF X=80 THEN Y=Y-DY:GOSUB 150:GOTO
    210
UR 570 GOSUB 150:IF LG=N10-LS THEN 540
II 580 PP=(X-N48)/N8:LOCATE PP,LL(PP),ZZ:
   IF ZZ=N32 THEN SC=SC-50:GOSUB 1470:GOT
   O 360
SG 590 IF CNT THEN 670
RP 600 IF LL(PP)=N6 THEN CNT=N1:GOTO 670
FI 610 IF ZZ<225 OR ZZ>250 THEN 540
LJ 620 FOR I=N1 TO N10-LS:IF R$(I,I)=CHR$
   (ZZ-128) THEN 650
GC 630 NEXT I
RA 640 POSITION PP,LL(PP):? #N6;"■":FOR I
   =N15 TO N10 STEP -N1:SOUND N0,N5,N0,I:
   FOR W=N1 TO N3:NEXT W:NEXT I:GOTO 700
KB 650 SOUND N0,30,N10,N14:POSITION PP,LL
   (PP):? #N6;CHR$(ZZ-160):LG=LG+N1:TON=N
   0
HO 660 POKE 89,SCREEN:POSITION PX(SCR)+LG
   ,PY(SCR):? #N6;CHR$(ZZ):POKE 89,STAIRS
   :GOTO 700
QW 670 IF ZZ<>190 THEN 610
GD 680 X=X-N8:Y=Y+N8*(X>80):GOSUB 180:POS
   ITION PP,N17:? #N6;"■":SOUND N0,150,N1
   0,N10
GW 690 FOR I=LL(PP) TO LL(PP)-N5 STEP -N1
   :POSITION PP,I:? #N6;" ":POSITION PP,I
   -N1:? #N6;"■":GOSUB 520:NEXT I
EO 700 SOUND N0,N0,N0,N0:GOTO 540
NW 710 IF X>160 OR X<88 THEN POP :GOTO 21
   0
AW 720 ST=STICK(N0):DX=(ST=N7)*N8-(ST=N11
   )*N8:X=X+DX:PP=(X-N48)/N8:RETURN
TN 730 POSITION N19,N4:? #N6;"-":GOSUB 19
   0:APP$="AFCAI W<<<<<":TON=N1
YW 740 FOR I=N1 TO N12:POSITION N16,I+N7:
   ? #N6;APP$(I,I):NEXT I:IF LL(PP)=N6 TH
   EN 540
EK 750 REM *** ARRANGE PUZZLE ***
AK 760 GOSUB 710:GOSUB 150:LOCATE PP,N17,
   ZZ:SOL=N1:IF ZZ<>32 THEN 760
KG 770 LOCATE PP,LL(PP),ZY:IF ZY=191 OR Z
   Y=N32 THEN 760
IU 780 IF STRIG(N0) THEN IF CC<N2 THEN 76
   0
VR 790 IF CC=N2 THEN 820
EM 800 GOSUB 510:FOR I=LL(PP) TO N16:POSI
   TION PP,I:? #N6;" ":POSITION PP,I+1:?
   #N6;CHR$(ZY):GOSUB 520:NEXT I
YC 810 POSITION PP,N17:? #N6;CHR$(ZY+160)
   :SOUND N0,N0,N0,N0:CC=CC+N1:LL(CC)=PP:
   LL(CC+N2)=ZY:GOTO 760
NX 820 GOSUB 710:GOSUB 180:FOR I=N1 TO 30
   :NEXT I
MO 830 POSITION LL(N1),LL(LL(N1)):? #N6;C
   HR$(LL(N4)):POSITION LL(N2),LL(LL(N2))
   :? #N6;CHR$(LL(N3)):CC=N0:SC=SC-N20
PJ 840 POSITION LL(N1),N17:? #N6;" ":POSI
   TION LL(N2),N17:? #N6;" ":GOSUB 1470:G
   OTO 760
YA 850 REM *** PUZZLE SOLVED? ***
FV 860 X=X+N8:Y=Y-N8:POS=PR:GOSUB 180
EH 870 PP=(X-N48)/N8:LOCATE PP,LL(PP),ZZ:
   IF LL(PP)=N6 THEN IF LCH=N10-LS THEN 9
   30
PS 880 IF LL(PP)=N6 THEN APP$="OMPPK######
   ":TON=N0:GOSUB 190:GOTO 740
QQ 890 IF ZZ>192 OR ZZ=191 THEN 860
NE 900 IF R$(PP-N4,PP-N4)=CHR$(ZZ+N32) TH
   EN LCH=LCH+N1:SC=SC+TIM:GOSUB 1470:GOS
   UB 190:GOTO 920
QW 910 GOTO 860
OD 920 POSITION PP,LL(PP):? #N6;CHR$(ZZ+1
   28):GOTO 860
FH 930 FOR I=120 TO 30 STEP -30:SOUND N0,
   I,N10,N10:FOR W=N1 TO 100:NEXT W:POSIT
   ION N16,I/30:? #N6;" ":NEXT I
CR 940 SOUND N0,N0,N0,N0
RJ 950 SC=SC+TIM*N5:GOSUB 1490
WU 960 X=X+N8:POS=PR:GOSUB 180:FOR W=N1 T
   O N15:NEXT W:IF X=200 THEN 980
RS 970 GOTO 960
FD 980 IF SCR=N6 THEN GOSUB 1020
RA 990 POKE 559,N0:LG=N0:CC=N0:LCH=N0:LC=
   N0:TL=N0:CNT=N0:CHK=N0:SCR=SCR+N1:X=N0
   :Y=N0:LS=N0:PUZ=N1:SOL=N0:GOSUB 180
XN 1000 TIM=201:R$(N9,N9)=" ":R$(N10,N10)
   =" ":IF SC<N10 OR SCR=N1 THEN 2380
AO 1010 AA=N1:BB=N1:GOTO 1520
FI 1020 FOR I=500 TO 100 STEP -N2:SOUND N
   0,I/N2,N10,N10:SOUND N1,I,N14,N14:POKE
    708,I/N2:NEXT I
LB 1030 SOUND N0,N0,N0,N0:SOUND N1,N0,N0,
   N0:RETURN
EO 1040 FOR I=N20 TO 100 STEP N5:SOUND N0
   ,I,N10,N10:FOR W=N1 TO N5:NEXT W:NEXT
   I:SOUND N0,N0,N0,N0:RETURN
RH 1050 REM *** WHERE TO GO ***
SQ 1060 GRAPHICS N17:POKE 559,N0:POKE 756
   ,CHSET:POKE 709,N1:POKE 712,N1:POS=PN
VQ 1070 IF AA THEN GO=SCREEN:GOSUB 1110+S
   CR*N10:GOTO 1090
TT 1080 GOSUB 1110+SCR*N10:GO=STAIRS:X=48
   :Y=144:GOSUB 1190
YL 1090 DL=PEEK(560)+256*PEEK(561)+N4:POK
   E DL,N0:POKE DL+N1,GO:POKE 88,N0:POKE
   89,GO:GOSUB 1240
ET 1100 GOSUB 1470:GOSUB 1490:GOSUB 180:P
   OKE 559,62:IF AA THEN 30
NU 1110 GOTO 210
FA 1120 POKE 704,88:POKE 708,60:POKE 709,
   N1:POKE 710,125:POKE 711,184:POKE 712,
   N1:X=104:Y=112:RETURN
KO 1130 X=128:Y=144:POKE 708,122:POKE 709
   ,N0:POKE 710,216:POKE 711,246:POKE 712
   ,N0:RETURN
CO 1140 X=88:Y=112:POKE 704,31:POKE 708,1
   72:POKE 709,145:POKE 710,125:POKE 711,
   199:POKE 712,145:RETURN
BZ 1150 X=112:Y=144:POKE 704,88:POKE 708,
   31:POKE 709,N0:POKE 710,214:POKE 711,1
   59:POKE 712,N0:RETURN
SJ 1160 X=152:Y=112:POKE 704,31:POKE 708,
   77:POKE 710,201:POKE 711,140:RETURN
UA 1170 X=136:Y=112:POKE 704,88:POKE 708,
   28:POKE 709,208:POKE 710,201:POKE 711,
   121:POKE 712,208:RETURN
RZ 1180 X=N0:Y=N0:POKE 708,76:POKE 709,88
   :POKE 710,24:POKE 711,215:RETURN
VQ 1190 IF BB=N0 THEN RETURN
PD 1200 POKE 82,N0:POKE 77,N0:POKE 88,N0:
   POKE 89,STAIRS
SD 1210 IF LS<>N0 THEN POSITION N14,N6:?
   #N6;"■":POSITION N14,N7:? #N6;"■":POSI
   TION N14,N1:? #N6;" "
RK 1220 IF LS=N2 THEN POSITION N13,N7:? #
   N6;"■":POSITION N13,N8:? #N6;"■":POSIT
   ION N13,N2:? #N6;" "
ZA 1230 BB=N0:RETURN
AL 1240 IF SCR=N7 THEN POP :POKE 764,255:
   GOTO 1280
LC 1250 IF LC=N0 THEN POSITION N12,N21:?
   #N6;" ":RETURN
AV 1260 RETURN
TO 1270 REM *** ONE MORE TIME ***
IB 1280 IF SC<N10 THEN 1350
CP 1290 POKE 559,62:POSITION N0,N10:? #N6
   ;SC:FOR I=N1 TO 500:NEXT I
CC 1300 POSITION N2,N4:? #N6;"mlc":POSITI
   ON N14,N4:? #N6;"kmpc":POSITION N2,N16
   :? #N6;"eykc"
VJ 1310 POSITION N15,N16:? #N6;"W/I":GOTO
    2570
MT 1320 OPEN #N1,N4,N0,"K:":GET #N1,A:CLO
   SE #N1:IF A<>ASC("Y") AND A<>ASC("N")
   THEN 1320
PW 1330 IF A=ASC("N") THEN END
GB 1340 SCR=N0:GOTO 990
NI 1350 POSITION N2,N16:? #N6;"JMOR":POSI
   TION N15,N16:? #N6;"YJJ":POKE 559,62
OW 1360 GOTO 1300
MJ 1370 REM *** KEYS AND SCORES ***
YC 1380 GOSUB 150:POSITION (X-N48)/N8,(Y-
   N32)/N8:? #N6;CHR$(ZZ+128):ON SCR-N2 G
   OTO 1390,1400,1410,1440
LE 1390 POSITION N16,N6:? #N6;" ":GOSUB 1
   040:POSITION N16,N7:? #N6;" ":RETURN
IG 1400 POSITION N3,N10:? #N6;" ":GOSUB 1
   040:POSITION N3,N11:? #N6;" ":RETURN
VX 1410 KEY=KEY+N1:IF KEY=N2 THEN 1430
AR 1420 POKE 89,SCREEN:POSITION N6,N5:? #
   N6;" ":GOSUB 1040:POSITION N6,N6:? #N6
   ;" ":POKE 89,STAIRS:RETURN
IK 1430 POSITION N15,N14:? #N6;" ":GOSUB
   1040:POSITION N15,N15:? #N6;" ":KEY=N0
   :RETURN
AE 1440 KEY=KEY+N1:IF KEY=N2 THEN 1460
XM 1450 POKE 89,SCREEN:POSITION N4,N6:? #
   N6;" ":GOSUB 1040:POSITION N4,N7:? #N6
   ;" ":POKE 89,STAIRS:RETURN
TJ 1460 POSITION N13,N9:? #N6;" ":GOSUB 1
   040:POSITION N13,N10:? #N6;" ":KEY=N0:
   RETURN
YO 1470 IF SC<N10 THEN SCR=N6:GOTO 990
WI 1480 POSITION N17-INT(CLOG(SC)),N21:?
   #N6;" ";SC:RETURN
WG 1490 TIM=TIM-N1:POSITION N9-INT(CLOG(T
   IM)),N21:? #N6;" ";TIM:IF TIM<N2 THEN
```

```
   POP :SC=SC-200:GOSUB 1020:GOTO 990
AJ 1500 RETURN
LB 1510 REM *** THE STAIRS ***
PX 1520 GRAPHICS N17:POKE 82,N0:POKE 88,N
   0:POKE 89,STAIRS
KC 1530 POSITION N0,N0:? #N6;"##############
   #########   ##############
   ######   #############   "
YL 1540 POSITION N0,N4:? #N6;"##############
   #        ##  ########   ######
   #############    ######"
QG 1550 POSITION N0,N8:? #N6;"##########
   ##########      ##########
   ####  #    #     ######"
PF 1560 POSITION N0,N12:? #N6;"    #
   #####   #       ######  #
   ##########    #####"
MA 1570 POSITION N0,N16:? #N6;"#######
   ####################>>>>>>>>>>>#####
   #                    #"
UX 1580 IF SCR=N5 OR SCR=N6 THEN GOSUB 25
   60
SK 1590 GOTO 2080
BO 1600 REM *** SCREENS ***
AR 1610 POKE 89,SCREEN:AA=N0:GOTO 1560+SC
   R*60
BF 1620 POSITION N0,N0:? #N6;"##############
   ##########+&  )  &  )  &  &  &'
   '(  *  (  *  (  (  ("
QH 1630 POSITION N0,N4:? #N6;"# #############
   ### #### ##+&  )  )  )  )  &'
   '(  *  *  *  *  *  ("
XG 1640 POSITION N0,N8:? #N6;"##### ### ####
   ####### ##+& )  )   ,,,,,&  &'
   #,,,,,'  (  *  *    ,,,,,(  ("
KT 1650 POSITION N0,N12:? #N6;"##### ### ###
   ############+&  )   ##############+'
   ###############+(  *   ##############+"
JE 1660 POSITION N0,N16:? #N6;"# #### #####R
   FC ACJJYP+&  )  ##############+'
   ##############+(  *  ###############+"
QG 1670 GOTO 2040
FW 1680 POSITION N0,N0:? #N6;"##############
   ###########+&  )   ##ZYQCKCLR#+'      #
   ##############+(  *    ##############+"
YA 1690 POSITION N0,N4:? #N6;"# ###### ####
   ###########+&  )  )  &  )  &  &'
   '      '(  *      (  *     ("
EV 1700 POSITION N0,N8:? #N6;"# ###    ###
   #### #####+&  )    )  )   &  &'  '
   '(  (  *  *  *   (  ("
CE 1710 POSITION N0,N12:? #N6;"### #######
   ######## ##+#   ,,,,,   )  )    &# #,,,
   ,#    #    ,,,,,    *  *    ("
CF 1720 POSITION N0,N16:? #N6;"#   ########
   ### #### ##+#  ###   ##  )  #   &#
   '  #    '#              (  #   ("
PH 1730 GOTO 2040
XD 1740 POSITION N0,N0:? #N6;"##############
   ##########+&  &  &  )  &  )  &'  '
   )      '(  (  (   *     *  ("
RE 1750 POSITION N0,N4:? #N6;"#  (  (    (
   *  ### ##+&  #  ##############   &'  '
   #  '(  (              #  ("
HY 1760 POSITION N0,N8:? #N6;"#      ######
   #### #####+&         ,,,,,   &  &'  *  #,
   ,,,,#     '(  (    ,,,,,    (  ("
MY 1770 POSITION N0,N12:? #N6;"# ### ######
   ######### ##+&  )  ##QMSRCPPYGL#+  &'   ####
   ###########+  '(      ##############+  ("
HW 1780 POSITION N0,N16:? #N6;"# ### #######
   ######### ##+&  &  )  )        )  &'  '
   '(  (  *  *        *  ("
OO 1790 GOTO 2040
TM 1800 POSITION N0,N0:? #N6;"##############
   ###########+&    )  ##EPMSLBDJHMP#+'    ###
   ###########+(    *  ##############+"
CP 1810 POSITION N0,N4:? #N6;"# #### ######
   ############+&   #   &  )  )  )  &'  #   '
   '(  #    (  #  *  *  ("
YD 1820 POSITION N0,N8:? #N6;"# ######## ###
   ## ### ##+&  #   )   #  )  &  &'  #
   #       '(  #     #  *  (  ("
OP 1830 POSITION N0,N12:? #N6;"### # ######
   ######### ##+&  #   )        ,,,,,   &'  #
   #,,,,,#  '(  #  *     ,,,,,     ("  '
TO 1840 POSITION N0,N16:? #N6;"# ####### ###
   ######### ###+&  )   &  )  )      &'   '
   '(  *  (  *  *       ("
OE 1850 GOTO 2040
OG 1860 POSITION N0,N0:? #N6;"##############
   ###########+&  )  )  &  )  &   &'
   '(  *  (  *  (   ("
RF 1870 POSITION N0,N4:? #N6;"##### ######
   ##+  ### ##+&  &  #   &  )  &'   #
   '   '  '(   ( ###  *  ###+  (   ("
OE 1880 POSITION N0,N8:? #N6;"# ###########
   ####+ # ##+&  )   ,,,,,     )  &'    #,,
   ,,,#   '(      *  ,,,,,     ("
YK 1890 POSITION N0,N12:? #N6;"# ### ###+ ####
   #### #### ##+&  )       )      #   &'
   #   '(  *              #  ("
PN 1900 POSITION N0,N16:? #N6;"# ###########
   ######### ##+&  ###KCXXYLGL##+  )   &'  #####
   ########+    '(   ##############+"
PU 1910 GOTO 2040
YF 1920 POSITION N0,N0:? #N6;"##############
   ###########+&   &  )  )  &  &  &'  '
   '  '  '(   (  *  *  (  (  ("
GW 1930 POSITION N0,N4:? #N6;"# ####### ###
   #### ### ##+&   #  )  )  &  )  &  &'  #
   '   '  '(   #  *  (  *  (  ("
QR 1940 POSITION N0,N8:? #N6;"# ###########
   ####### ##+&    ,,,,,    #  )   &'  #,,,,,
   #  #   '(    ,,,,,     #    ("
ZM 1950 POSITION N0,N12:? #N6;"# ########
   ########## ##+&  )    )  ########+  &'
   ##ZCJ##+  '(   *  *   ##CRYEC#+  ("
EU 1960 POSITION N0,N16:? #N6;"# #### #####
   #############+&      &      ##############+'   '
   ############+(   (      ##############+"
QM 1970 GOTO 2040
CP 1980 POSITION N0,N0:? #N6;"##############
   ##############################
   ######## ######  ###########       ###"
QG 1990 POSITION N0,N4:? #N6;"#%HMS #### #
   ### FYTC$####                ######
   $#######   ##########   $####"
HP 2000 POSITION N0,N8:? #N6;"#####    +EPCY
   P$#  ########%  #          $########%  #
   #  $#######%  #        #  $####"
KX 2010 POSITION N0,N12:? #N6;"#####    #%QA
   MPC$  ##########   ##########   ########
   #######                 ###"
LE 2020 POSITION N0,N16:? #N6;"#%KYBC ####
   #### GR#$####        ######   ####
   ########## #########################"
FE 2030 POSITION N0,N20:? #N6;"##############
   ###########rfc pmmd eypbcl###########
   ##############":AA=N1:GOTO 1060
HL 2040 FOR I=N1 TO N19:POSITION LX(SCR,I
   ),LY(SCR,I):? #N6;WORD$(I+(SCR-N1)*N19
   ,I+(SCR-N1)*N19):NEXT I
CP 2050 FOR I=N6 TO N15:R$(I-N5,I-N5)=WOR
   D$(I+(SCR-N1)*N19,I+(SCR-N1)*N19):NEXT
   I
PJ 2060 FOR I=N1 TO N10:IF R$(I,I)=" " TH
   EN LS=LS+N1
MR 2070 NEXT I:POSITION LX(SCR,N21),LY(SC
   R,N21):? #N6;CHR$(96)
DW 2080 POSITION N0,N20:? #N6;"##############
   #############+"
VP 2090 POSITION N0,N21:? #N6;")":POSITIO
   N N1,N21:? #N6;SEL$(CH*N6-N5,CH*N6)
NE 2100 POSITION N11,N21:? #N6;"          +
   ":POSITION N0,22:? #N6;"##############
   #######+"":IF AA=N1 THEN 1610
CZ 2110 AA=N1:GOTO 1060
IN 2120 REM *** TITEL ***
YN 2130 GRAPHICS N17:POKE 708,N8:POKE 710
   ,200:POKE 711,248:POKE 87,N0
YD 2140 POSITION N1,N2:? "# ## ## ### ###
   ####":POSITION N21,N2:? "# #  $% $% #
   # #"
OU 2150 POSITION N1,N3:? "# ## $% $% ###
   ###":POSITION N21,N3:? "#  # $% $% #
   # %"
BL 2160 POSITION N1,N4:? "### ### $% $% ###
   # #":POSITION N21,N5:? "### #### ### ### #
   ###"
RN 2170 POSITION N1,N6:? "#  # # #  $% #
   #":POSITION N21,N6:? "#  # # ### $% #
   ###"
NY 2180 POSITION N1,N7:? "#  ####  # $% #
   #":POSITION N21,N7:? "### # # ### $% ###
   ###"
RM 2190 POSITION N9,N10:? "ZW":POSITION N
   3,N11:? "ncrcp Mf ikcwcp"
AT 2200 REM *** INITIALIZING ***
QR 2210 DIM PR$(N7),PL$(N7),PN$(N7),PMOV$
   (100),WORD$(114),LX(N6,N21),LY(N6,N21)
   ,APP$(38),APP1$(38),SEL$(30)
HN 2220 DIM R$(10),LL(N16),PX(N6),PY(N6)
GY 2230 RTOP=PEEK(106)-24:POKE 106,RTOP:P
   OKE 54279,RTOP:PMB=RTOP*256:SCREEN=RTO
   P+N8:STAIRS=RTOP+N16
BR 2240 RESTORE 3810:FOR I=N1 TO 100:READ
    A:PMOV$(I)=CHR$(A):NEXT I:MOVE=ADR(PM
   OV$)
LV 2250 FOR I=N1 TO N7:READ A:PR$(I)=CHR$
   (A):NEXT I
FG 2260 FOR I=N1 TO N7:READ A:PL$(I)=CHR$
   (A):NEXT I
HP 2270 FOR I=N1 TO N7:READ A:PN$(I)=CHR$
   (A):NEXT I
TP 2280 PL=ADR(PL$):PR=ADR(PR$):PN=ADR(PN
   $):POKE 53277,2
XM 2290 DIM CHM$(20):CHSET=RTOP:CHBASE=25
   6*CHSET:POKE 204,CHSET:POKE 206,224
YM 2300 RESTORE 2620:FOR I=N1 TO N20:READ
    A:CHM$(I)=CHR$(A):NEXT I:Q=USR(ADR(CH
   M$)):POKE 756,CHSET
WZ 2310 FOR I=CHBASE+24 TO CHBASE+111:REA
   D A:POKE I,A:NEXT I
KC 2320 FOR I=CHBASE+216 TO CHBASE+255:RE
   AD A:POKE I,A:NEXT I
NB 2330 FOR I=CHBASE+256 TO CHBASE+471:RE
   AD A:POKE I,A:NEXT I
ID 2340 FOR I=CHBASE+128 TO CHBASE+207:RE
   AD A:POKE I,A:NEXT I
AY 2350 FOR I=N1 TO N6:READ A,B:PX(I)=A:P
   Y(I)=B:NEXT I
ED 2360 FOR I=N1 TO N16:READ A:LL(I)=A:NE
   XT I:CH=INT(RND(N0)*N2)
BE 2370 RESTORE 3180+CH*90:FOR SC=N1 TO N
   6:FOR I=N1 TO N21:READ A,B:LX(SC,I)=A:
   LY(SC,I)=B:NEXT I:NEXT SC
CJ 2380 GRAPHICS N16:POKE 559,N0:POKE 756
   ,CHSET:DL=PEEK(560)+256*PEEK(561):FOR
   X=N20 TO 24:POKE DL+X,N6:NEXT X
BH 2390 POKE 710,N2:POKE 708,200:POKE 752
   ,N1:POKE 82,N0:POKE 559,62
OA 2400 ? "MSP AYQRJC AMLQGQRQ MD QGV QRM
   PGCQ. GRGQ WMSP YGK RM AJGKZ DPMK RFC
   ACJJYP"
AH 2410 POSITION N2,N2:? "RM RFC PMMD EY
   PBCL. RFGQ UMSJB ZC LMNPMZJCK GD RFCP
   C UCPC LMR RFC TCPW ZYB"
BI 2420 POSITION N2,N4:? "QRYGPQ YLB RFC
   JMAICB GPML BMMPQ RM ZCMNCLCB RFPMSEF
   WMSP AJCTCPLCQQ."
OF 2430 POSITION N2,N6:? "RFC KGQQGLE QRC
   NQ MD RFC QRYGPQ AYL ZCDGUCB ZW AMJJCA
   RGLE JCRRCPQ YLB RFCL"
TJ 2440 POSITION N2,N8:? "NJYAGLE RFCK SL
   BCP RFC QRCNQ."
FX 2450 POSITION N2,N9:? "Z5R MLJW GD RFC
   W YPC YPPYLECB GL RFCGPNPMNCP MPBCP RF
   C GPML BMMP UGJJ MNCL."
NT 2460 POSITION N2,N11:? "RFC NSXXJC UMP
   BQ RFYR DPCC WMSP UYW SNRM RFC PMMD E
   YPBCL ZCJMLE RM TYPGMSQ"
CE 2470 POSITION N2,N13:? "RMNGAQ RFYR AY
   L ZC AFMMQCL LMU."
CS 2480 POSITION N5,N15:? "1.AGRGCQ":POSI
   TION 25,N15:? "2.QRYRCQ":POSITION N5,N
   16:? "3.QNMPRQ"
UZ 2490 POSITION 25,N16:? "4.YLGKYJ":POSI
   TION N5,N17:? "5.NCMNJC"
BF 2500 POSITION 26,N18:? "KYIC WMSP AFMG
   ":POSITION N0,19:? "AC YLB EMMB JSAI"
PM 2510 OPEN #N1,N4,N0,"K:":GET #N1,A:CLO
   SE #N1:IF A<ASC("1") OR A>ASC("5") THE
   N 2510
HU 2520 CH=A-N48:PUZ=INT(RND(N0)*N7):REST
   ORE 3270+CH*90+PUZ*N10:READ WORD$,APP$
   ,APP1$
KX 2530 FOR I=N1 TO 38:WORD$(38+I,38+I)=A
   PP$(I,I):WORD$(76+I,76+I)=APP1$(I,I):N
   EXT I
TT 2540 SCR=N1:SC=1500:TIM=201:SEL$="agrg
```

```
   cggryrcggnmprgyigkyincmnjc"
BL 2550 AA=N1:BB=N1:GOTO 1520
MU 2560 POSITION LX(SCR,N20),LY(SCR,N20):
   ? #N6;CHR$(96):RETURN
DE 2570 RESTORE 2580:FOR I=1536 TO 1556:R
   EAD A:POKE I,A:NEXT I
FK 2580 DATA 104,173,11,212,101,20,10,141
   ,10,212,141,22,208,173,252,2,201,255,2
   40,237,96
NE 2590 X=USR(1536)
PA 2600 IF PEEK(764)<>255 THEN 1320
MG 2610 REM *** DATA ***
YR 2620 DATA 104,162,4,160,0,177,205,145,
   203,200,208,249,230,206,230,204,202,20
   8,242,96
QL 2630 DATA 182,247,0,189,189,0,247,182
RI 2640 DATA 11,15,0,11,11,0,15,11
MC 2650 DATA 96,112,0,208,208,0,112,96
MT 2660 DATA 0,184,0,232,232,0,184,184
FB 2670 DATA 0,232,232,0,184,184,0,232
ZW 2680 DATA 232,0,184,184,0,232,232,0
OM 2690 DATA 0,184,0,232,232,0,184,176
AZ 2700 DATA 0,0,104,232,0,184,184,0
DB 2710 DATA 168,232,0,184,184,0,232,168
PY 2720 DATA 204,204,204,204,204,204,204,
   204
FD 2730 DATA 16,24,12,126,126,12,24,16
XW 2740 DATA 8,24,48,126,126,48,24,8
NT 2750 DATA 255,129,129,129,255,129,129,
   129
KD 2760 DATA 9,15,6,6,15,9,15,9
JE 2770 DATA 0,24,36,126,0,0,0,0
BG 2780 DATA 255,219,219,231,231,219,219,
   255
XE 2790 DATA 0,2,37,45,125,7,2,0
ER 2800 DATA 0,254,102,112,240,102,62,0
FL 2810 DATA 0,248,108,102,230,108,124,0
SX 2820 DATA 0,254,96,124,224,102,126,0
QQ 2830 DATA 0,254,99,252,108,96,96,0
GP 2840 DATA 0,254,102,96,238,102,62,0
XR 2850 DATA 0,118,54,126,54,54,118,0
AG 2860 DATA 0,126,24,60,24,24,126,0
FW 2870 DATA 0,14,6,6,246,102,60,0
PU 2880 DATA 0,230,110,248,120,110,102,0
II 2890 DATA 0,240,96,224,96,110,126,0
OY 2900 DATA 0,227,119,255,107,99,119,0
IT 2910 DATA 0,230,118,126,126,110,246,0
US 2920 DATA 0,254,102,230,102,102,126,0
VL 2930 DATA 0,252,102,238,124,96,112,0
DM 2940 DATA 0,254,102,230,102,108,118,0
GN 2950 DATA 0,252,102,230,124,108,118,0
RV 2960 DATA 0,254,96,126,6,102,126,0
EG 2970 DATA 0,126,216,24,24,24,28,0
WK 2980 DATA 0,230,102,230,102,126,124,0
EW 2990 DATA 0,230,102,230,102,126,24,0
EO 3000 DATA 0,227,99,235,127,119,99,0
QL 3010 DATA 0,230,102,60,60,102,118,0
CN 3020 DATA 0,230,102,60,24,56,56,0
DD 3030 DATA 0,254,108,24,48,102,126,0
IW 3040 DATA 0,248,60,102,102,126,231,0
UA 3050 DATA 0,252,102,252,102,102,124,0
IV 3060 DATA 0,254,102,238,118,102,126,0
EQ 3070 DATA 0,24,120,120,24,24,126,0
QV 3080 DATA 0,124,102,76,24,54,126,0
FK 3090 DATA 0,126,206,24,12,102,62,0
ZD 3100 DATA 0,12,28,60,108,254,12,0
OA 3110 DATA 0,254,96,252,6,102,124,0
ZH 3120 DATA 0,124,224,124,230,102,126,0
GC 3130 DATA 0,254,102,12,24,48,48,0
RK 3140 DATA 0,60,102,60,230,102,254,0
CI 3150 DATA 0,254,102,254,6,12,56,0
VU 3160 DATA 8,19,8,3,5,15,7,3,3,19,8,17
LW 3170 DATA 0,0,0,15,16,15,14,13,12,11,1
   0,9,8,7,6,4
WA 3180 DATA 2,3,5,1,11,2,14,5,18,7,18,1,
   16,11,11,7,7,3,5,7,3,17,1,19,2,9,1,7,1
   4,3,5,11,1,13,7,14,6,19,0,23,0,23
JJ 3190 DATA 11,5,2,7,8,7,18,7,5,11,11,11
   ,5,3,4,8,5,17,11,19,14,15,18,10,15,5,1
   ,1,1,11,15,11,1,19,13,19,18,18
DK 3200 DATA 0,23,0,23
FK 3210 DATA 12,1,18,1,5,4,14,4,18,11,18,
   5,5,19,2,4,2,1,8,4,2,11,15,17,18,19,8,
   17,1,6,18,15,2,13,2,18,10,19
KJ 3220 DATA 0,23,15,9
PV 3230 DATA 2,1,2,5,5,7,8,5,12,9,9,9,14,
   11,17,18,5,18,5,15,6,3,12,5,11,17,18,5
   ,1,19,7,19,1,14,18,11,14,5,0,23,18,18
TO 3240 DATA 4,1,10,1,18,3,1,7,18,5,2,1,1
   8,7,2,9,16,3,7,3,18,13,18,19,11,5,14,1
   ,2,19,2,13,4,9,5,3,16,17,4,6,4,7
AG 3250 DATA 9,3,15,11,18,10,18,13,3,13,2
   ,13,3,15,3,3,9,7,12,3,15,7,18,1,15,3,1
   8,4,12,11,5,19,1,19,8,13,6,1
OO 3260 DATA 0,1,5,5
PJ 3270 DATA 8,1,13,1,5,5,8,7,14,7,4,3,2,
   15,7,17,18,5,7,18,3,19,10,7,11,5,7,19,
   18,9,1,11,5,13,18,11,7,15,0,23,0,23
DD 3280 DATA 6,1,13,7,15,9,7,11,8,11,4,5,
   1,14,14,17,17,19,16,13,18,5,18,15,10,6
   ,6,7,14,13,11,17,16,15,5,5,2,9
EL 3290 DATA 0,23,0,23
II 3300 DATA 4,1,7,1,4,7,18,9,12,2,18,7,1
   7,19,6,7,1,9,2,15,12,17,15,19,8,19,7,1
   9,9,4,1,19,2,1,11,17,5,19
WC 3310 DATA 0,23,5,3
IV 3320 DATA 5,1,1,13,9,7,15,7,18,7,3,3,6
   ,6,6,9,5,11,7,11,7,13,4,17,12,7,15,9,1
   8,13,15,17,11,19,13,19,17,19,0,23,5,13
GI 3330 DATA 2,3,16,1,18,1,11,3,11,6,8,1,
   2,5,16,19,18,5,18,9,3,10,18,10,3,11,18
   ,11,13,6,14,11,14,6,5,1,14,1
RI 3340 DATA 0,6,8,3
DA 3350 DATA 1,1,3,1,9,1,6,3,3,5,9,5,18,1
   5,3,13,6,13,2,13,3,19,3,2,2,3,11,1,8,1
   3,18,7,2,19,6,17,6,15,0,19,12,1
RK 3360 DATA duzjkamnclfyeclisbrrlribkypq
   cgjjc mzes
SG 3370 DATA snkmxjclglepyb izqdcefkmayqy
   zjylaycpgd
WK 3380 DATA aydwjcbglzspef kqrhyebfykcjz
   msplc qadr
QH 3390 DATA vdtjgykqrcpbyk melsigxdbhcps
   qyjck mzle
RG 3400 DATA jypwekmlrctgbcmsppugjjemkyla
   fcqrcpdbos
QI 3410 DATA ecdrcfgpmqfgky zsclkccebdpyl
   idspr qgnq
YF 3420 DATA afsrjqgleynmpc bjkjidyyljgtc
   pnmmj bkbq
HW 3430 DATA skgerzypacjmly dgbqaspzcuyqf
   glermldpjj
KT 3440 DATA nsqqgzcrfjcfck pmiylcspmgqjy
   kyzyb ndpl
NO 3450 DATA cdrkcwsemqjytgyzpvbempqgtclc
   xscjy rfab
LE 3460 DATA sjkecgtmpwamyqrczbfcebmzysqr
   pyjgy nicd
RK 3470 DATA kzbmdypeclrgly qsjfyblydjsvc
   kzmspelgni
GT 3480 DATA afrsjglbmlcqgy kwpeiqnjmkysp
   crylgybafu
HO 3490 DATA zsqqgepccljylb rfmkfsndraykc
   pmml  bgzq
SW 3500 DATA qclbgnmprseyj  fcixckrcjlgay
   pyesy rfmq
MB 3510 DATA mqigpesyrckyjy nmlbzceskqamr
   jylb  fgdg
TP 3520 DATA clecpkyjywqgy  imurcnqmkzsje
   ypgy  bdfr
PN 3530 DATA cnqckrfygjylb  ksaiqasfslcux
   cyjylbzpmd
BS 3540 DATA cnqgkdmmrzyjj  lesispqgkbcay
   rfjml nide
WS 3550 DATA yjzkbgacfmaicw lysumircpqugk
   kgle  vwcn
YL 3560 DATA psqqgtmjjcwzyjjafgnyzmnsupcq
   rjgle vkmd
FE 3570 DATA cndzjkypyrfml  bcbqskpmdzyqi
   crzyjjgllg
PL 3580 DATA bcddmewklyqrgaqsnpcdbqqguyrc
   pnmjm iosg
SO 3590 DATA grrcpjmlehskn  fcafgeqpknclr
   yrfjmlspqb
BB 3600 DATA yiccpmjwkngaq  blzrcicqszybk
   glrml wnip
JI 3610 DATA cppscqfmmrgle  aidbmlsknyrfj
   crgaq piux
DR 3620 DATA slgiremjbkcbyj qsqnigjjqrmsp
   lykclrdzab
AG 3630 DATA cnqskyjjgeyrmp fcafcnqslypky
   bgjjm drse
IN 3640 DATA cjcskqumpbdgqf rwncepsqdylrg
   jmnc  isbs
XY 3650 DATA mpzsqcjcnfylr  igzpesdijpfgl
   macpmqnsbb
SZ 3660 DATA cnqskemjbdglaf pyqrmnrzwqosg
   ppcj  kmky
KD 3670 DATA qsqrcamaipmyaf jgddcndpykmqo
   sgrm  clef
PA 3680 DATA cjjmkzyppyasby ctlgdyjjsaclr
   gncbc fwyi
NV 3690 DATA eyqqgzsrrcpdjw kmllcnqmkrypy
   lrsjy vdue
FK 3700 DATA xslgdaykcjmnypbfszfcnqckayle
   ypmm  sdcb
VK 3710 DATA cbbcjaynpgampl svsqpbrrsafyk
   cjcml gdiq
UQ 3720 DATA cjckbuyqfglermlpsdjybykgzccr
   fmtcl pskd
NB 3730 DATA mppnzuyjrbgqlcwskimpmqqnjydy
   wcrrc gels
HN 3740 DATA yjjykcglqrcgl  osimmqrqgajyp
   ieyzjcslbk
XP 3750 DATA lmpmekcrfsqyjckbmnnyjgeshcdd
   cpqml ryir
LG 3760 DATA mrrmkjglbyctylqpskdaykgjpsrf
   cpdmpbnyqq
XS 3770 DATA cqafckypiruygl sjjmybykmjglb
   zcpef daiq
DD 3780 DATA ybmjdzcplqrcgl eyknaiknecgqc
   lfmucpybyj
VE 3790 DATA mjbsqkgaihyeecpzwndafsaiqrct
   clqml ypyj
MU 3800 DATA xbdzeuwyrrcypn sqjmlskainwrf
   yempyqcjzc
PY 3810 DATA 216,104,104,104,133,213,104,
   24,105,4,133,206,104,133,205,104,133,2
   04,104,133,203,104,104,133,208
QO 3820 DATA 104,104,133,209,104,104,24,1
   01,209,133,207,166,213,240,16,165,205,
   24,105,0,133,205,165,206,105
UH 3830 DATA 1,133,206,202,208,240,160,0,
   162,0,196,209,144,19,196,207,176,15,13
   2,212,138,168,177,203,164
MN 3840 DATA 212,145,205,232,169,0,240,4,
   169,0,145,205,200,192,0,208,224,166,21
   3,165,208,157,0,208,96
CV 3850 DATA 24,60,122,126,60,36,54
HX 3860 DATA 24,60,94,126,60,36,108
XW 3870 DATA 24,60,90,126,60,36,102
```





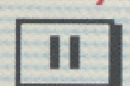
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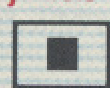
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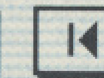
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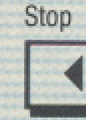
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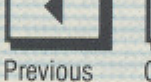
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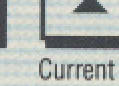

Pause

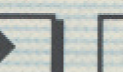

Stop


First


Rewind


Previous


Current

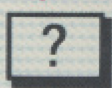

Next


F/Forward


Last

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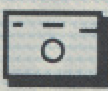
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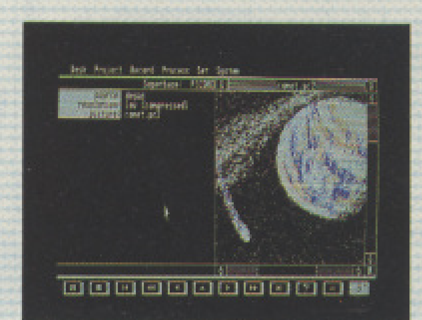
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Report break levels	34

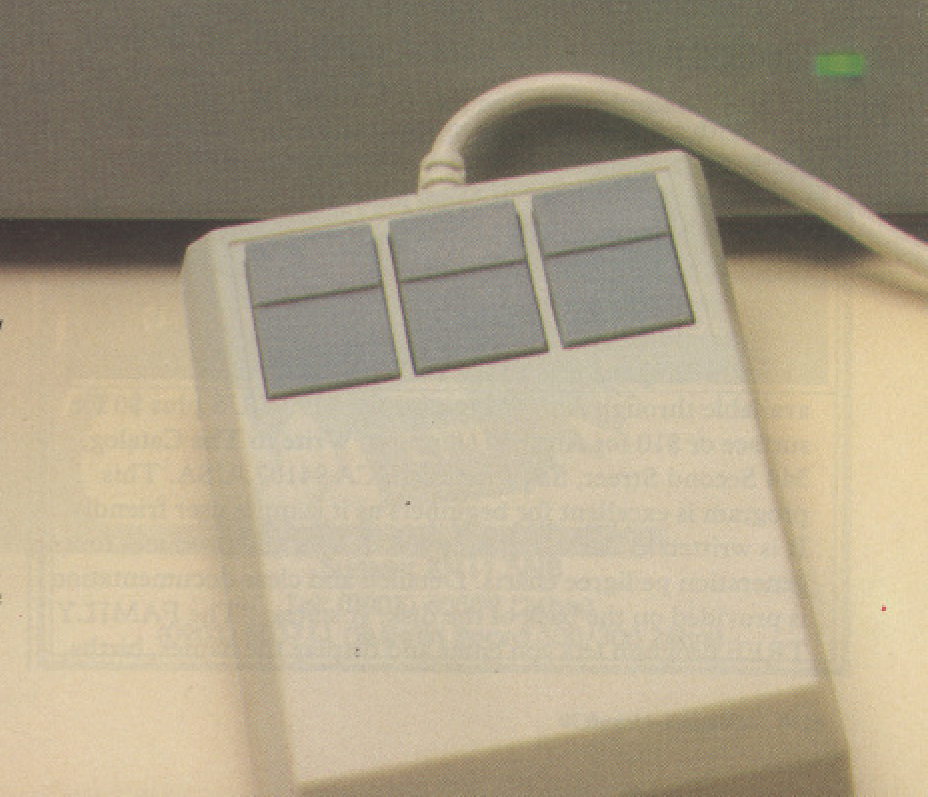
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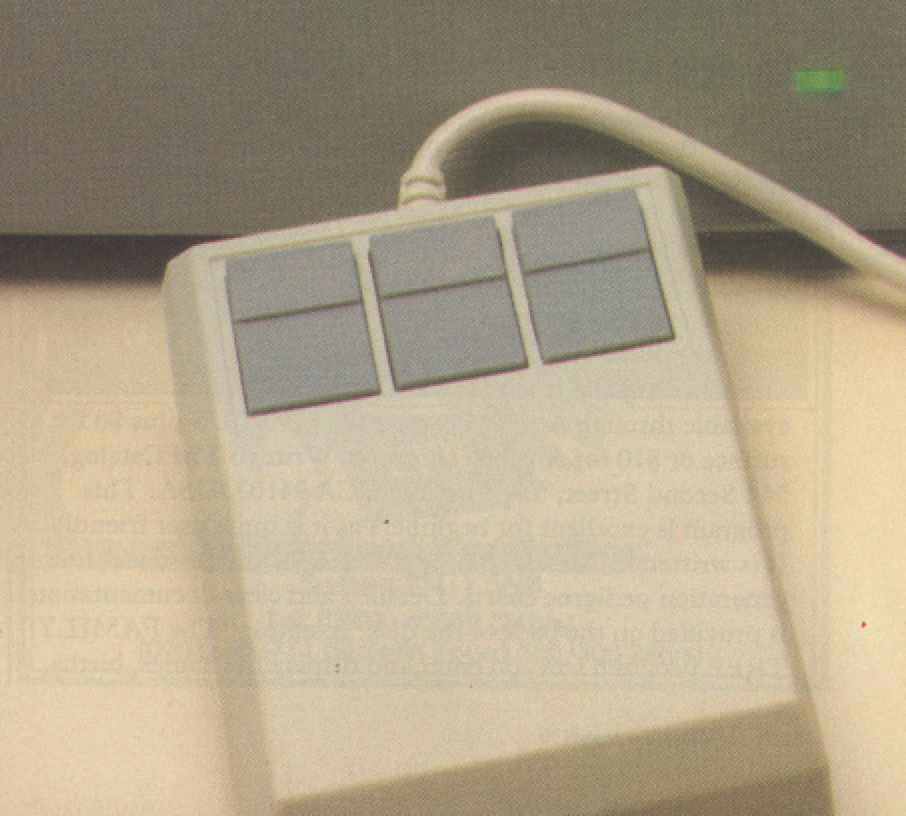
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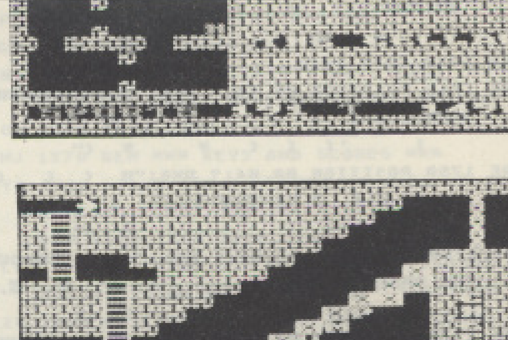
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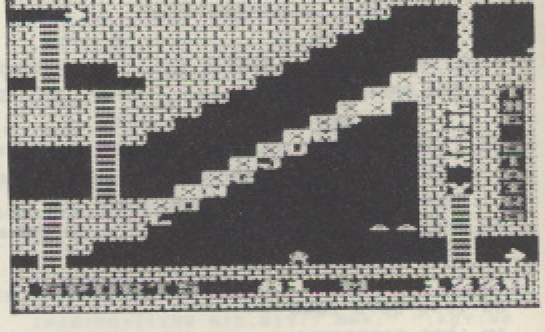
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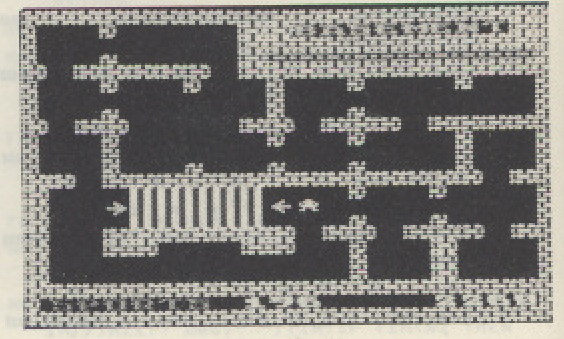
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IW 3040 DATA 0,248,60,102,102,126,231,0
UA 3050 DATA 0,252,102,252,102,102,124,0
IV 3060 DATA 0,254,102,230,118,102,126,0
EQ 3070 DATA 0,24,120,120,24,24,126,0
QV 3080 DATA 0,124,102,76,24,54,126,0
FK 3090 DATA 0,126,206,24,12,102,62,0
ZD 3100 DATA 0,12,28,60,108,254,12,0
OA 3110 DATA 0,254,96,252,6,102,124,0
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RK 3140 DATA 0,60,102,60,230,102,254,0
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SW 3500 DATA qclbgnmprseyj  fcixckrcjlgay
   pyesy rfmq
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TP 3520 DATA clecpkyjywqgy  imurcnqmkzsje
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PN 3530 DATA cnqckrfygjylb  ksaiqasfslcux
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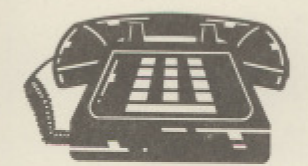






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PAGE 6 MAGAZINE
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Feature

GENEALOGY and your ATARI

William A. Benbow reviews three software packages for your 8-bit Atari that will help you trace your ancestors

The combination of the study of one's genealogy with the power of the computer makes for a fascinating hobby. I have traced my line back to that great British hero, Admiral John Benbow (1653-1702), and written and published his biography. All on my Atari 130 XE.

If you are interested in learning more about your roots, about your family history, then you should know about some very practical ways your Atari can help you.

The task of searching for and finding your ancestors is much like that of solving an Agatha Christie mystery. You start with some known facts, find clues along the way, and piece together a picture much like you would a jigsaw puzzle. With genealogy however, you find very quickly that you are overwhelmed with data and spend most of your time searching through your own notes. The computer can bring order to this chaos. It is superbly suited to store data, sort it, search for relationships, and print reports.

Over the years genealogists have developed two basic forms to organize family history data. The first is a Family Worksheet which is used to record essential identifying information for each nuclear family, that is a husband, wife and children. Included in such a record are the names of their parents and dates and places for everyone's birth, marriages, and death. The form may also include additional notes such as occupations, hobbies, and military service. It does not take long to develop hundreds of these family worksheets as your ancestral tree doubles with each generation. Genealogists also use a second form, the Pedigree Chart, to show these generations pictorially. Such a chart usually has room for four or five generations starting with yourself and working backwards through your parents, grandparents, etc.

USING YOUR ATARI

With a bit of imagination you can easily use a standard database program like Synfile to store your data. All of the information lends itself to being stored and sorted as fields. The drawback is that a standard database program is not designed to sort genealogical data in a pedigree format, so several programs have been developed specifically for Atari 8-bit computers, to do just that.

The simplest is **FAMILY TREE** by Harry Koons and available through Antic Magazine for $19.95 US plus $6 for surface or $10 for Air mail shipping. Write to The Catalog, 544 Second Street, San Francisco, CA 94107, USA. This program is excellent for beginners as it is quite user friendly. It is written in Basic, requires 40K RAM, and produces four generation pedigree charts. Detailed and clear documentation is provided on the back of the disk. It states: "The FAMILY TREE program lets you enter and display the names, births, marriages, deaths, and a short biographical note for each person in your family pedigree. The screen displays a tree with a unique cursor. You move the cursor about the tree using a joystick or the keyboard to select a person from the chart. Their historical data can than be displayed or edited on the screen."

Although a total of 24 generations may be stored on one disk, they must be broken down into separate files of 6 each. Pedigrees cannot be made which overlap files, so it is not possible to make a chart of your great-grandparent unless you start a new file with him. This involves a fair bit of duplication. Also, although charts may be printed in 10 characters per inch, they are best printed in compressed mode (17 characters per inch) for readability. The greatest limitation is that this is not really a database program. Data cannot be sorted by fields, and is quite restricted. Family worksheets are not utilized so you cannot store information on siblings, cousins, etc. With FAMILY TREE you are limited to pedigree charts.

MORE POWERFUL PROGRAMS

To do more you need much more powerful programs. **BRANCHES** and its companion program **TWIGS** is just that. It is a genealogy database program specifically developed for Atari computers by Sysco Software, 939 Bross Street, Longmont, CO 80501, USA. Cost is BRANCHES $45, TWIGS $25. I am not sure of shipping costs.

This program is also written in Basic and requires 40K RAM plus an Epson compatible printer. BRANCHES is the main database program and utilizes both individual and family worksheets. From this information it produces five generation pedigree charts, however no more than five generations can be stored on a disk, so pedigrees which overlap disks will involve a lot of disk swapping. On the positive side disks can store a large number of children's records, including up to 160 children for the 16 great-great-grandparent families. Disk space is also committed to a unique time line feature which gives brief accounts of selected events for dates between 1400 and 1969, to provide historical perspective.

The companion program TWIGS is designed to produce a descendants chart which shows children, grandchildren and great grandchildren of a given individual. It can also store data on cousins, nieces, nephews etc. and allows you to find the relationship between any two people on the same disk.

This is an easy to operate and view program, well written, with complete step by step manuals. The main limitation is the restriction to five generations per disk and, being written in Basic, you may find searches a bit slow.

NO LIMITS

A third program available for Atari computers, has been produced by William C. Walden of Direct Lines Software, 4755 Bamboo Way, Fair Oaks, CA 95628, USA. Titled **FAMILY HISTORY**, it is available for $39.95 US.

It requires 48K RAM and is the most powerful of these programs. There is no limit to the number of family member records you can keep. Multiple disks are possible, with each disk capable of storing 350 individual records of 41 fields each. Each record can contain up to four spouses and 15 children per marriage. It produces a five generation pedigree chart for any individual in the database, and a Family Group Chart on any individual, including all immediate family member's names. As well it will print a report of all data from all records in the file and an index sorted by individual number or name.

A nice feature of this program is its easy to use menu and its capacity to compress data by removing the empty spaces between records when you make a back up copy. The main advantage, however, is its open-ended storage capacity. It is not limited to five or six generations so is much more flexible. Speed is another asset, since the original Basic program has been 'compiled' and now runs ten times faster. It also supports double density.

The pedigree chart is a bit disappointing in that it does not include place names or marriages. The FAMILY TREE pedigree chart is much superior, but is limited to four generations. Also I had difficulty figuring out a good numbering system. The computer will assign numbers to individuals automatically, but since it allows a personally devised system, some greater instruction would be helpful.

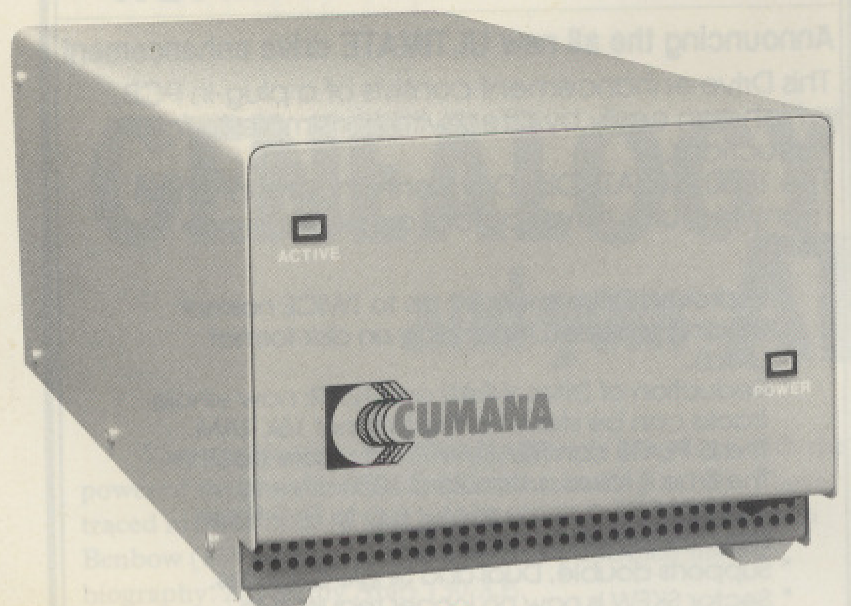
Of the three programs, I prefer FAMILY HISTORY because of its open-endedness. However, BRANCHES AND TWIGS has the added features of a time line to give context to one's ancestors and also offers more in terms of tracking indirect relations such as cousins. FAMILY TREE is the easiest to use program and produces the best pedigree charts.

GET SEARCHING!

So there you have three programs which you can use on your 8-bit Atari to help in researching your ancestors. Perhaps you will find the search for your roots an exciting mystery to delve into, and you too may find an ancestor, such as my Admiral Benbow, worth writing about. •

William A. Benbow is from British Columbia in Canada and is indeed a descendent of the famous Admiral Benbow. He has written several articles for genealogical journals and computer magazines and recently published a biography of his famous ancestor produced entirely on his 130XE.

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Independent User Group

STAGE

The PAGE 6 ST section

November/December 1987



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Using GEM from C

CYBERSTUDIO

ZOOMRACKS II

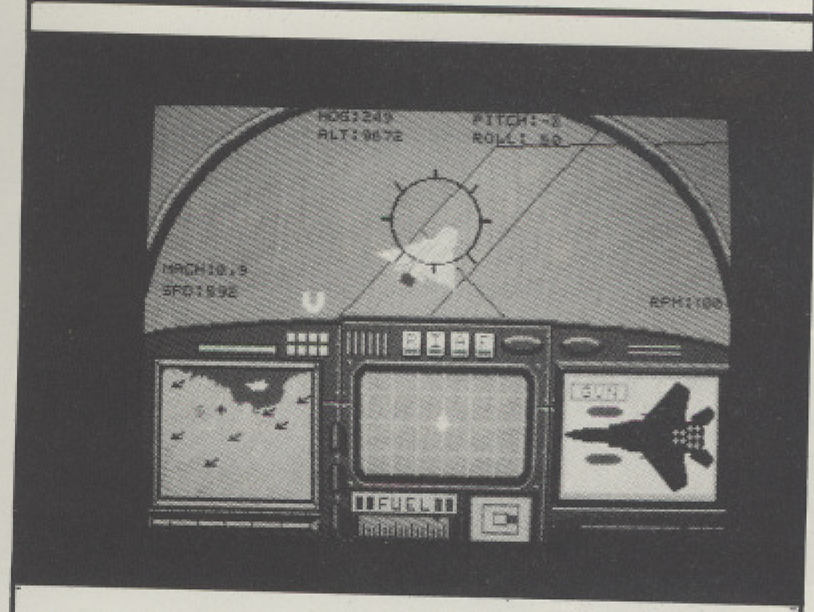
The innovative database in its new version

Jupiter Probe

Hacker II

TNT

F-15 FOR ST!



Microprose have some great news for ST flight simulator fanatics with the conversion of **F-15 STRIKE EAGLE** to the ST in late September at a price of £24.95. F-15 has already been written about extensively in many publications and fully reviewed in PAGE 6 but it will be exciting to see it using the full power of the ST.

Mastertronic have begun to ship their ST games which all retail at £9.99. September releases were **CHOPPER X** and **STRIKE**. If the quality is good and they sell well, maybe it will persuade other manufacturers to offer games software at more reasonable prices.

Infocom have a most unusual offering of eight short stories that are not so much adventures as a series of wordplay puzzles. Even the title will get you thinking, **NORD AND BERT COULDN'T MAKE HEAD OR TAIL OF IT**! Written by Jeff O'Neill, author of Ballyhoo, it contains all the humour and intellectual challenge of Infocom's adventures but is designed for those who fancy solving a puzzle in an evening. Each of the eight tales will only take a few hours to solve but will challenge you to the full. Price is £29.99.

English Software, once well known for its support of Atari, is slowly coming back to the Atari fold with a new ST release, **LEVIATHAN**, which is not, as you might suspect, about whales, but is an arcade style shoot 'em up which looks from the screen shots to be quite similar to Zaxxon.

Metacomco have been busy upgrading various products and now have **LATTICE C Version 3.04** which seems to have all features necessary to make it the leading C development system for the ST. The new version costs £99.95 but upgrades are available to existing owners for £30. Also released is **PASCAL 2** which provides an ISO standard core but with a large range of extensions for programmers who wish to access the power of the ST. There are many enhancements to the program and a new manual of over 700 pages giving program developers another powerful tool for the ST. Price is £89.95.

A new budget range for the ST comes from **ANCO** who have a cross-licensing deal with **Kingsoft** of Germany. Kingsoft have a large number of games and utilities for various machines but at the time of writing it was not clear what would be available for the ST. If the quality is good, it looks like 'budget' software for the ST has finally arrived.

ANTIC Software has released **BASE TWO**, a new database which is essentially a powerful extension of DB Master One which many owners received free with their ST. BASE TWO is entirely RAM based for speed and has many powerful features together with a flexible report generator that is compatible with all ST word processors.

Electronic Arts recently launched their U.K. subsidiary Company with a little party on the Thames at which they announced a new marketing strategy for the U.K. whereby the Company will distribute direct to retailers thus ensuring that there is a greater awareness of Electronic Arts products at the level where it is most important. Electronic Arts will be supporting the ST with titles such as **BARDS TALE**, **CHESSMASTER 2000**, **MARBLE MADNESS** and **DEGAS ELITE** which will all be repackaged and re-priced for the U.K. Electronic Arts will also distribute for affiliated labels and have agreements already with **CRL** and **Nexus** whose titles **ACADEMY** and **SKULLDIGGERY** for the ST are already in the shops.

Electric Distribution, who already handle Antic Software's products in the U.K. now have a special 'bundling' deal with Timeworks whose three business packages **WORD WRITER ST**, **DATA MANAGER ST** and **SWIFTCALC ST** can be had for only £149 for all three, a saving of £110! Also included in the deal is a subscription to **Softline**, a software support service for these products.

Infogrames have an enormous range of entertainment software lined up for the ST. Many of these have a typically French style and some unusual themes. Here we go. **SIDEWALK** is a mono program in which you have to retrieve you stolen motorbike and collect your girlfriend with some tickets for a concert! **L'AFFAIRE** is another in the successful Crime series where you travel seven European Cities trying to prove your innocence having been accused of a crime you didn't commit. **THREE MUSKETEERS** is based on the famous book and is an adventure set in eighty graphical locations. Off you go, D'artagnan! **PASSENGERS ON THE WIND II**, is naturally the sequel to the first graphic adventure and continues the tale to regain the birthright of a deposed noble lady. Following in October is **CHAMPIONSHIP WATER SKI** in which you can take part in three events in the World Championships. Phoenix is a shoot 'em up game where you have to keep the space lanes open fighting pirates and hijackers. **BIVOUAC** promises to be one of the most unusual and interesting games being a mountain climbing simulation! Now you will be able to find out what Chris Bonnington does with his computer! There's more! In November you should see **SPACE RENEGADE, PROHIBITION 2, THE GRAND VIZIR – IZNOGOOD, BUBBLE GHOST, STRYFE 2, CRASH GARRETT, CRAFTON 2, ANACONDA III, BOB MORANE I** and **CAPTAIN BLOOD**. More details as they are released. Talk about prolific output!

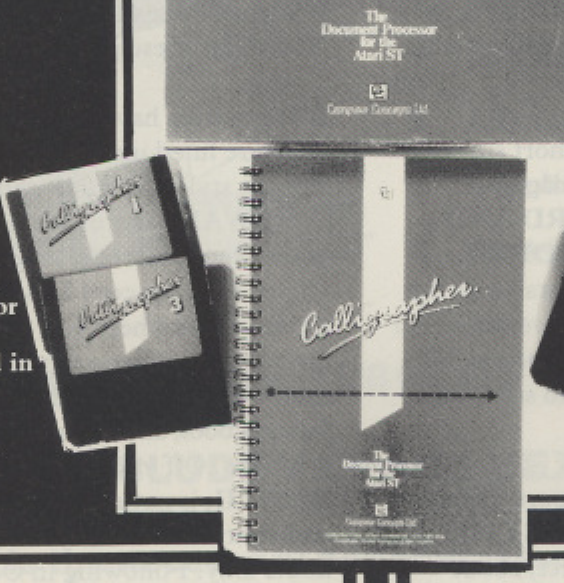
Calligrapher

The Document Processor

This completely new word processor has been written specifically for the Atari ST, running under GEM, and contains many features only previously found on desk top publishing programs. However, Calligrapher goes further than any of these by providing an incredibly comprehensive range of word processing facilities.

Calligrapher is a pure WYSIWYG document processor. It shows on screen the document exactly as it will appear on the paper, including different font styles, graphics, page breaks, headers, footers etc. It supports multiple column text which is automatically re-formatted after every change. This means there is no 'format' key to press and ensures the screen is always up-to-date. Up to ten documents can be held in memory at once, each with their own window.

● Multi-column text. The layout of text is controlled by rulers. There can be any number of rulers at any point in the document and these control the margins, tab settings (both normal and decimal), the number of columns below the ruler etc. And because the text is automatically re-formatted, any change to the ruler, for instance dragging the margin indicators, will instantly be reflected in the text.



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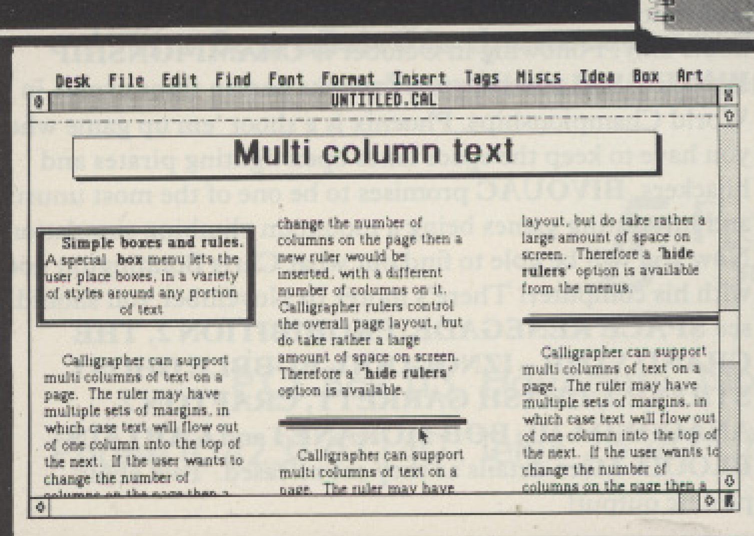
Professionally written 210 page manual,

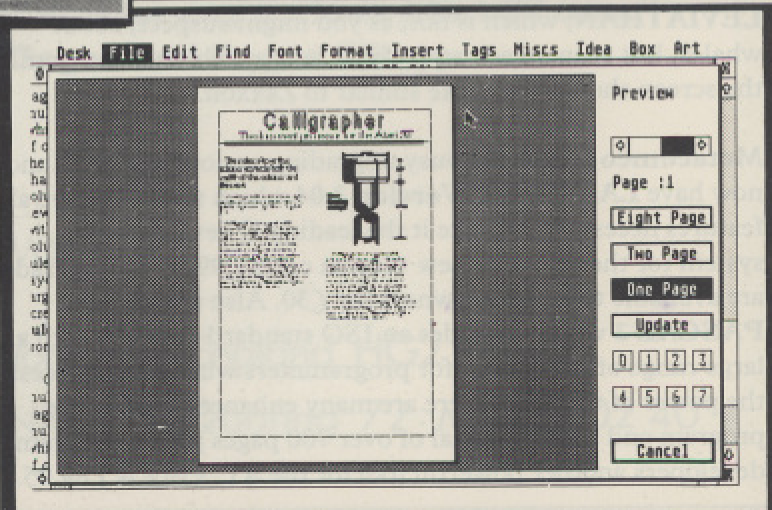
4 Discs

+ a quick reference card and installation instructions.

● Multiple on-screen fonts. Two styles are supplied in the package (SWISS and TIMES) which can be printed in a variety of sizes. In addition, Calligrapher supports a variety of text effects such as bold, underline, sub and superscript, italic, outline and strikeout.

● Any portion of the document may be marked (including rulers, graphics and text), just by clicking the pointer at the start of the region and dragging. Once marked this region may be copied to the clipboard—and from there pasted in to any other part of the document. The text style and size may be easily changed from a menu option.





• Printers. Since Calligrapher works under GDOS it will work with any printer supported by GDOS. At the moment we supply GDOS drivers for Epson FX and compatibles (9 pin), Star NB15 24 pin. Printout samples from the Epson and Atari laser are available on request. Hopefully the range of GDOS printers and fonts will increase over time and these will be made available to Calligrapher owners as and when we receive them.

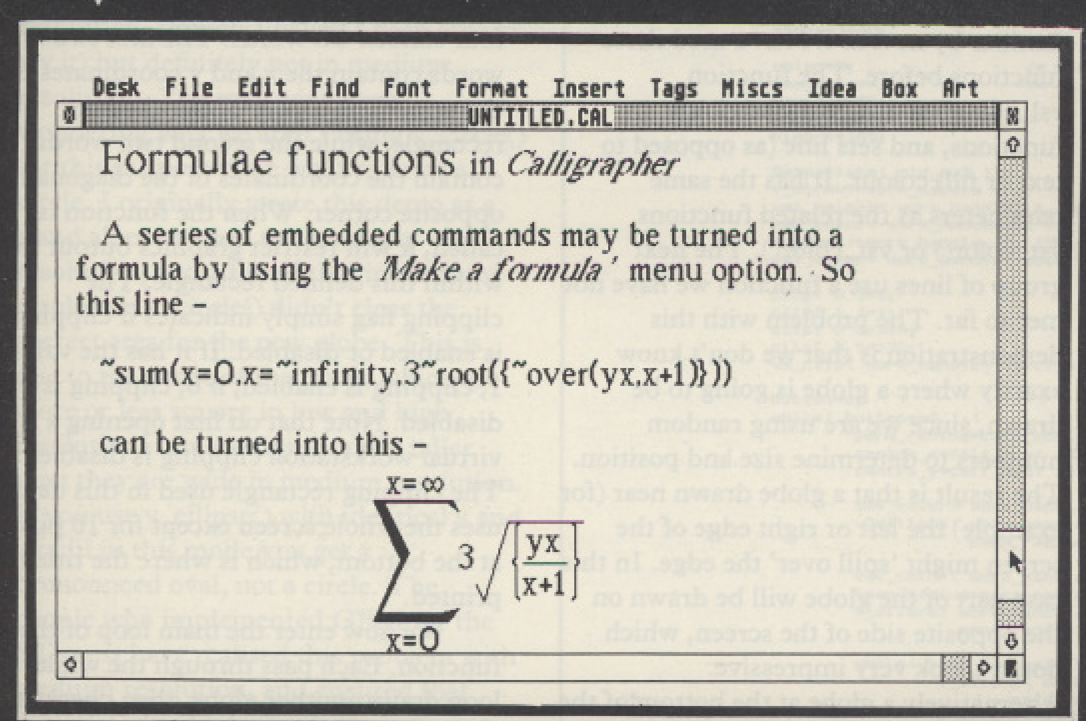
• Boxes and line styles. This simple, but very effective, feature enables boxes to be placed around any part of the text, such as headings. Also a variety of column break lines can be placed in the text to liven up the appearance of documents.

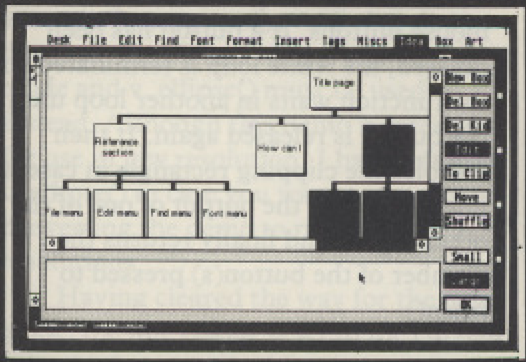
• Multi-page preview. One, two or eight page preview facilities are available. This shows an accurate scaled down image of the final page, including graphics etc., and enable the overall document layout to be checked prior to printing.



• Formulate functions. Complex formulae are difficult if not impossible to create in most word processors. Calligrapher has a special formulae creation mode that supports over 60 common mathematical symbols and Greek letters etc. See examples.

• Spelling checker. A 60,000 word dictionary allows very fast spelling checking—even checking as you type with no loss of typing speed (1040 only). Misspelt words are shown highlighted in context, and Calligrapher will suggest some alternatives, at this point the suspect word may be ignored, corrected or added to the user dictionary.





• Outlining facilities. Calligrapher supports a highly graphical outliner, or ideas processor. This helps in the creation of complex documents and helps the user create the correct structure for a document before writing in earnest. The outline for a document may be displayed graphically as a tree structure or may be pasted into the document in a more traditional textual way with each 'level' of the structure being further indented.

• A full specification is available on request.



24 hour despatch service available—just ring 0442-63937.



Computer Concepts Ltd

Gaddesden Place
Hemel Hempstead
Herts HP2 6EX
Tel 0442 63937

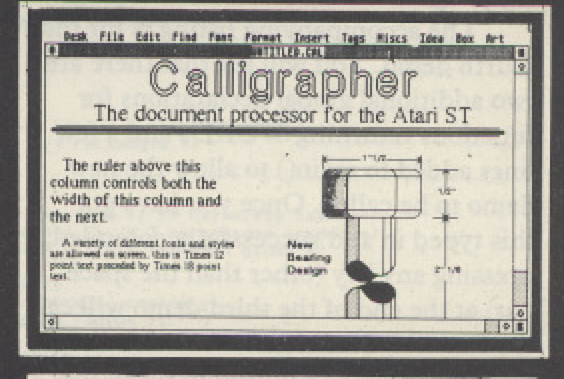
• Auto page and paragraph numbering. Page numbering is, of course, supported, but in addition there are facilities for automatically numbering any sequence of objects such as paragraphs, or chapters etc. If a new paragraph is inserted then all subsequent paragraphs can be automatically re-numbered.

• Powerful search and replace. Calligrapher provides very extensive search and replace facilities, allowing single and multiple wildcards and the ability to search for embedded codes for font changes, graphics, rulers etc.

• Import and export. A variety of utilities are supplied on disc that allow text to be imported from ASCII or 1st Word files and output as ASCII. It is also possible to convert Degas and Neochrome to the required .IMG monochrome format.

• Keyboard shortcuts. Being menu driven makes Calligrapher easy to learn, but the experienced user will probably find these cumbersome. Therefore the program supports keyboard shortcuts to all the common Calligrapher functions.

• On the page graphics. Calligrapher can import both .GEM and .IMG graphics files and display them anywhere on the page. The user may re-scale any graphics images (either enlarge or reduce) to fit the required space. Conversion utilities are provided that allow Degas and Neochrome pictures to be used. If you don't want to import the graphics from other programs then Calligrapher contains its own drawing tools.



OTHER CALLIGRAPHER FEATURES:

• Substitutes. Commonly used phrases or long words may be assigned to special key combinations.
• Multi-line footers, headers and footnotes.
• Table making facilities.
• Text mode. For quick text only printing or for driving printers other than those supported by GDOS—even daisy wheels.
• Mail merge. Multiple field records may be merged with a document as it is printed allowing such things as personalised letters etc.

Package includes Installation details
Price £69.00 (inc VAT and postage)

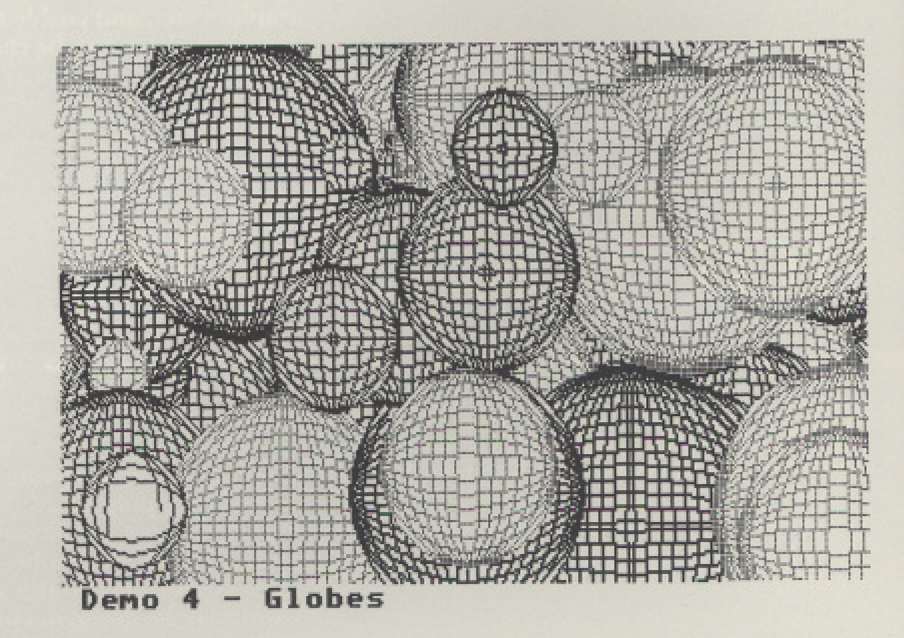
• Calligrapher works with the Atari 520 ST (with some restrictions on the number of fonts and the dictionary) and on the 1040 and Mega STs. It also supports both Mono and colour medium res. monitors.



VISA

Using GEM from the C language

Graphics and Random Numbers in the third part of Steve Pedler's series


Demo 4 - Globes

This is the third part of this series which looks at the use of the ST's GEM interface from C. In it we shall take a third (and for the moment final) look at the graphics functions available from GEM and add another demonstration to the program we have been developing.

The accompanying listing is for the fourth demo. You will see that there are two additional global declarations for functions returning WORDs and a few lines added to main() to allow the new demo to be called. Once you have got this typed in and successfully compiled, pressing any key (other than the space bar) at the end of the third demo will call the function demo4(). To exit this demo, press either mouse button to rerun the whole program, or both buttons together to exit back to the desktop.

DEMONSTRATION 4

The purpose of this demonstration is to draw a series of 'wireframe' globes having a 3D effect. To make things more interesting the globes will be of different sizes scattered randomly over the screen. It starts off with the declaration and initialisation of some auto variables. The variables color and max_color limit the colors used in drawing the globes, so that only the color indices 2 to 7 inclusive are used. This is solely out of personal preference, and you can use the full range of colours (1 to 15) if you wish. Variables max_rad, high_x and high_y impose limits on the size and position of the globes and again can be changed if you wish.

The next five lines should be familiar by now as we have used these functions before. The function vsl_color() is one of the attribute functions, and sets line (as opposed to text or fill) colour. It has the same parameters as the related functions vst_color() or vsf_color(). The next group of lines use a function we have not met so far. The problem with this demonstration is that we don't know exactly where a globe is going to be drawn, since we are using random numbers to determine size and position. The result is that a globe drawn near (for example) the left or right edge of the screen might 'spill over' the edge. In this case part of the globe will be drawn on the opposite side of the screen, which doesn't look very impressive. Alternatively a globe at the bottom of the screen would overwrite the title of the demo. We could get round this by ensuring that the positioning of the globes was such that they could never approach the edge, but then they would tend to all be concentrated in the centre of the screen. What is needed then is a method of restricting – or clipping – graphic output to a defined area of the screen. It won't come as a surprise to find that GEM provides exactly that facility.

The function vs_clip() sets up a graphic clipping rectangle. It is called with the following parameters:

vs_clip(device handle, clipping flag, rectangle coordinates array)

The coordinates array is an array of four sixteen-bit words. The first two words contain the x and y coordinates of the upper left corner of the clipping rectangle, while the second two words contain the coordinates of the diagonally opposite corner. When the function is called, it will restrict graphics output to within this defined rectangle. The clipping flag simply indicates if clipping is enabled or disabled. If it has the value 1, clipping is enabled; if 0, clipping is disabled. Note that on first opening a virtual workstation clipping is disabled. The clipping rectangle used in this demo uses the whole screen except for 10 pixels at the bottom, which is where the title is printed.

We now enter the main loop of the function. Each pass through the while loop draws another globe, then checks to see if the user has pressed one of the mouse buttons. If a button has been pressed, the while loop is terminated and the function waits in another loop until the button is released again. It then disables the clipping rectangle in case it interferes with the output of one of the other demos and finally returns the number of the button(s) pressed to main().

THE MAIN LOOP OF THE DEMO

This is straightforward. Each pass through the loop, the size of the globe and its position on the screen is determined by three calls to calc_num(), discussed further below. The fill colour

is then set to zero (background colour) and the function v_ellipse() is called, which draws a filled ellipse on the screen. Since the fill colour is the background colour, the result is to clear an area of the screen where the next globe is going to be drawn. If this isn't done, the new globe overwrites the old one which tends to look a bit of a mess. In fact, if I remember my geometry correctly, what v_ellipse() draws is not an ellipse (a shape which has two centres, not one as a circle does) but an oval, which can be thought of as a circle which has different radii in the × and y planes. Be that as it may, the function is called with these parameters:

v_ellipse(device handle, centre × coordinate, centre y coordinate, × radius, y radius)

As indicated above, this function uses fill attributes. Clearly, if the × and y radii are the same you get a circle – or do you? The answer is that you do in low resolution (and probably also in high resolution, though I haven't been able to try it) but definitely not in medium resolution. You may have been wondering why we aren't using v_circle() for this purpose if we want to draw a circle. I originally wrote this demo as a stand alone version to run in any resolution, and I found that in medium resolution v_circle() didn't clear the correct area for the new globe. This is due to the shape of the pixels which are more or less square in low and high resolutions but are significantly taller than they are wide in medium resolution. If you use v_ellipse() with identical × and y radii in this mode you get a pronounced oval, not a circle. The people who implemented GEM for the ST must have realised this problem with medium resolution, and ensured that v_circle() would draw a true circle, not an oval. Consequently, v_circle() does not clear a sufficient screen area in this mode and v_ellipse() must be used instead. Although this demo is intended for use in low resolution, I have left it as v_ellipse() in case you want to try converting the demo to run in other resolutions.

Having cleared the way for the new globe, the line colour is set to the current value in the variable color and temp_radius is initialised. The function v_ellarc() is then called to draw the outline of the new globe. This function is analogous to v_ellipse() except that it uses line rather than fill attributes, and is supplied with two extra parameters to enable part of an ellipse (i.e. an elliptical

```
/* Part 3 of demonstrations of the use of GEM from 'C' */
/* By Steve Pedler for Page 6 Magazine, England */

/* The following lines should be added to the source code published in the
previous issues of Page 6 */

/* new global declarations */

WORD calc_num(), demo4();

/* new main() function - substitute this function for that
found in the previous version, so that the fourth demo can be called */

main()
{

        WORD c;

        init_gem();
        while( finished !=0 ){
            c=demo1();
            if( c==3 ) {
                finished=0; break;
            }
            c=demo2();
            if( c==3 ) {
                finished=0; break;
            }
            c=demo3();
            if( c==SPACE ) {
                finished=0; break;
            }
            c=demo4();                    /* new lines */
            if( c==3 ) {
                finished=0; break;
            }
        }
        finish_gem();
}

/* ------------------ demonstration #4 - draw a series of globes -------- */
WORD demo4()
{
       WORD centre_x, centre_y, perm_radius, temp_radius, color,
            starta, stopa, clip[ 4 ], c;

       int max_color, max_rad, high_x, high_y;

       starta=0;
       stopa=3600;

       color=2;                      /* These 5 parameters may be changed for */
       max_color=7;                  /* different effects */
       max_rad=50;
       high_y=180;
       high_x=305;

       Setpallete( old_pal );
       v_clrwk( work_handle );
       vst_height( work_handle, 6, &dum, &dum, &dum, &dum );
       vst_color( work_handle, 1 );
       v_gtext( work_handle, 8, 198, "Demo 4 - Globes" );
       vsl_color( work_handle, color );

       clip[ 0 ]=1;
       clip[ 1 ]=1;
       clip[ 2 ]=318;
       clip[ 3 ]=190;                    /* set up a graphics clipping */
       vs_clip( work_handle, 1, clip );  /* rectangle */

       button=0;
       while( button==0 ) {
               perm_radius=calc_num( 10, max_rad ); /* calculate the */
               centre_x=calc_num( 12, high_x ); /* 3 parameters needed */
               centre_y=calc_num( 12, high_y ); /* for each globe */

               vsf_color( work_handle, 0 );
               v_ellipse( work_handle, centre_x, centre_y,
                          perm_radius, perm_radius );

               vsl_color( work_handle, color );
               temp_radius=perm_radius-5;
               v_ellarc( work_handle, centre_x, centre_y,
                         perm_radius, perm_radius, starta, stopa );

               while( temp_radius>0 ){
                       v_ellarc( work_handle, centre_x, centre_y,
                               perm_radius, temp_radius, starta, stopa );
                       v_ellarc( work_handle, centre_x, centre_y,
                               temp_radius, perm_radius, starta, stopa );
                       temp_radius-=5; /* note: this is
 'temp_radius=temp_radius-5' */

               }
               color+=1;
               if( color>max_color ) color=2;
               vq_mouse( work_handle, &button, &dum, &dum );
       }
       c=button;
       while( button !=0 ) {
               vq_mouse( work_handle, &button, &dum, &dum );
       }
       vs_clip( work_handle, 0, clip );   /* disable clipping rectangle */
       return (c);
}

/* calculate the centres and radius */
WORD calc_num( small, large )
int small, large;
{
       double val_max, val_temp, ret_num;
       int random;

       val_max=2147483647.0;
/* ******** NOTE: if your compiler uses 16-bit ints rather than the 32
bits used by Lattice C, the 'magic number' val_max should be changed
to 32767.0 - this is very important! ********* */

       random=rand();  /* C library function for random numbers */
       val_temp=random/val_max;

       ret_num=( val_temp*large )+small;
       return (WORD)ret_num;
}
```

arc) to be drawn if desired. These two parameters (starta and stopa in this program) are the beginning and end angles for the arc, and are expressed in tenths of a degree. By setting them to 0 and 3600 respectively, we get a complete circle (this is similar to v_pieslice() which we used in the first demo in this series). There is of course a similar function which uses fill rather than line attributes; this is v_ellpie() which has exactly the same parameters as v_ellarc().

We now enter a second while loop in which the interior lines of the globe are drawn. Function v_ellarc() is called twice each pass through the loop to draw a series of ovals with steadily decreasing radii in both the × and y planes. It is this which gives the wireframe 3D appearance. The loop terminates when temp_radius becomes zero or less than zero. The value of color is then incremented, and if it exceeds max_color is reset to 2.

USING RANDOM NUMBERS

It only remains to discuss the workings of the function calc_num(). Two parameters are passed to the function, which are the minimum and maximum values of the random number to be returned. To generate the random number I have used the function rand() which is part of the ANSI standard for C and therefore should be part of the standard function library in all compilers. It returns a random number in the range zero to the maximum positive integer value for the compiler. This is an important concept, since it means that with Lattice C (used to write this program) which uses 32 bit integers the range of numbers returned by rand() will be 0 to 2,147,483,647 – hence val_max is set to this figure. If you use a compiler which uses 16 bit integers, you should change this figure to the maximum positive integer value obtainable, which is 32,767.

If we divide the number returned by the call to rand() by the maximum positive integer value, we obtain a number in the range 0 to 1. This number must be a floating point number, otherwise the decimal part will be discarded. Therefore val_temp and val_max are declared as doubles. Multiplying this figure by the upper limit and adding the lower limit gives us a figure in the range we want. Since this is still a double, it is cast to a WORD before returning it to the calling function.

I don't claim this is the best way of generating random numbers, but it works for this program. If you use it in other programs, one thing to beware of is that the maximum value returned by calc_num() is not the upper limit you pass to it, but the upper limit plus the lower limit value. You may need to adjust the upper limit parameter accordingly.

LOOKING AHEAD

In these three articles we have now looked at a reasonable selection of the graphics functions available from GEM. Other than the number and variety of different functions there is nothing particularly remarkable about any of them – though the GEM interface does make them easy to use. In the next article in this series, we should start to look at those functions which make GEM really stand out, namely the construction and use of windows, menus and dialogues. ●

LATTICE C
Version 3.04
Metacomco
£99.95

Reviewed by Matthew Jones.

Some time ago I reviewed the Lattice C compiler but Metacomco have now released a new version which is a major revision, including many more features. As a regular user of the compiler, I was very pleased to receive the new version as it has many new and very powerful facilities.

The manual is now a massive 3cm thick, with about 700 pages. It covers all the new features starting with general information about using the compiler, the language definition and the way it uses the computer, the compiler options, and how to use each of the new utility programs – Debug+, Ed, Krsc, Link, Make and Menu+. The complete C system library is covered together with GEM library functions and there is a bibliography, error messages, recent changes, example programs and finally customer support.

The three disks supplied provide a complete C programming environment. Two automating systems are provided: Menu+ which is suited to development of single source file programs (lots of them), the latest version of which solves minor problems that have been found as well as adding more functionality (like a program path) and Make which is the only sane way of managing a multiple source file program – again it has been improved.

A new GEM version of ED uses all the old keystrokes of the text mode version, but allows editing of four files simultaneously – generally a great improvement. It does have some problems however, like the inability to copy a block from one buffer to another – you have to write it to disk then read it back. The compiler has more facilities to improve it, and it now supports the proposed ANSI standard 'void' and 'enum' types, argument type checking, and complete structure passing (call by value).

Krsc is a GEM resource editor, written by Kuma, as reviewed by myself in a previous issue. As I said then, Krsc is a very capable program. Link is the linker from GST, as supplied in the previous version.

Debug+ is totally new. It is a symbolic machine level debugger. It has definable macros, which allow you to perform complex interrogations of your data, and the best thing of all is the 'backtrace' macro which allows you to wait for your program to bomb, and then find out the sequence of calls and parameters which caused it. I cannot give a complete description, but if you are stuck with SID, buy this – it's invaluable.

Over half the manual is used to describe the library functions. All sorts of really useful functions have been added, which I became jealous of on the IBM PC, and now have full access to on the ST. New functions include: qsort() – sorts any size array, getfnl() – gets filename list (reads a directory in one go), time(), fopene() – open a file with environment search, getdfs() – get disk free space, getft() – get a file's time. Many of these can be done yourself with Gemdos calls, but isn't it nice to have it done for you? There are many more – about 340 functions altogether.

Also included on disk is the source for the startup code so that you can customise it. The libraries are provided in two forms, one for GST Link, and one for Link68 – the rival linker (not supplied).

If you don't already have a C compiler, then you cannot get better value for money than Lattice C version 3.04. If you already have Lattice C, then you can upgrade for a reduced fee to a much improved package. If you already have a compiler, and are looking to a more capable compiler then look at Lattice. Note that while Lattice C is not the fastest to compile, it does produce code that is generally very fast. Personally, I have found it very reliable, and the support is good.

Overall, Metacomco have produced a very professional system. ●

SUPER DIRECTORY
Michtron U.K.
£24.95

Reviewed by Matthew Jones

It came as a bit of a surprise to me to find that Super Directory from Michtron U.K. (formerly Microdeal) is actually quite good. As regular readers will know, I have become rather disenchanted with their utility products (especially Sprite Construction Kit), but this is an exception. Super Directory is a disk organisation program, allowing the quick location of a file in a collection of disks.

Don't think that I am totally won over though! The same old manual writer has had a go at this manual which starts off by explaining a few terms, like records and fields, but explains it all backwards. Also included is an awfully off-putting mathematical explanation of 'sets' which adds to the confusion. Once it has passed the silly stage however it does have useful information, covering the main features.

Super Directory is a GEM based application. The main operation revolves around dialog boxes. The main dialog has a list of files in a large box, with buttons on the right hand side to select options. To add a disk to the directory the ADD button is used. This produces another dialog with a 'disk number' field in which you can enter a three letter code to identify the disk with, a 'disk to read' field, and the number of records free (dependent on memory – 3415 records (files) on my 512k machine). When you click on OK, it reads each directory on the disk, and reads all the disk file information. You are then left in the ADD dialog ready to add another disk. When you have added your disks, you are given a sorted display of the files. The sort can be done according to various categories, including disk, filename, extension, and time. You can scroll up and down the display, and select individual files. Each file can have a remark and a category added (to facilitate sorting by user type). You can FIND a particular file, or type of files, and then move to the next in the list found.

The most useful is the PRINT button which allows you to get a printout of your information in various formats (full pathnames, full remarks, filenames 3 across, pathnames 2 across, remarks 2 across), and according to the current search pattern. The printout allows you to refer to the information outside of Super Directory.

The information read from the disks can be stored on disk for later retrieval. If the file gets too big, subsections can be filtered off into other files.

Super Directory is not brilliant, but does do its job, and is not hindered too much by the manual. If you need a program to keep track of your disk directories, this program certainly merits examination. ●

FLASH

ANTIC Software

£39.95

Reviewed by John S Davison

Isn't it strange how some software feels 'right' almost as soon as you boot it up? I had that feeling with FLASH, a communications program from Antic, and after using it for a while I can honestly say that my initial impression was correct.

For £39.95 you get a cardboard bookform package containing a single sided disk and a 60 page instruction manual. The latter is clearly written, but I did find some topics a little fragmented. The program disk isn't copy protected, so you can easily make a backup copy or install it on a hard disk. Thank you, Antic, for this sensible policy.

Installation is simple, in fact you could, if necessary, run a comms session with the disk as supplied, however, you'll probably want to personalise it to suit your way of working and that's very easy to do.

Like most communications programs, FLASH has two modes of operation, known here as terminal mode, and capture buffer mode. You can quickly switch between the two with the press of a mouse button. It's from terminal mode that you conduct an online communications session with a remote computer system. Capture buffer mode is FLASH's offline control mode, where you can examine and manipulate the contents of the capture buffer, set up and edit various control files and parameters, and so on.

FLASH can be driven in several different ways: through the keyboard, using full command words, abbreviations, or Alt/Key combinations; or by using GEM's mouse and menu facilities. As you become familiar with FLASH's facilities you can progress to quicker ways of working – a nice design feature.

There are over 60 commands to learn, but you'll only regularly use a small subset of these. The manual includes an alphabetically organised reference section, which briefly lists and explains them all and there's also a Help command available giving on-screen assistance with the most often used features.

TERMINAL MODE

On startup, you find yourself in terminal mode. This screen isn't a GEM screen, so there's no mouse and menu options. Normally, anything you key in here gets transmitted. Current terminal parameter settings (such as baud rate, duplex, etc.) are shown on a status line at the bottom of the screen. This line also displays a real time clock, which can show either time of day or elapsed time – an extremely useful feature.

You may wish to issue a FLASH command from this screen, so to talk to FLASH rather than the remote system you have to first press the INSERT key. This turns the status line into a command input line. Following input of the command, the line turns back into a status line again. Neat design and quick to use!

FLASH's terminal mode screen is a true 80 × 24 configuration in medium resolution. It can also operate at 80 × 48 in high resolution, but I couldn't try this as I don't have a monochrome monitor. I found the display to be clear and perfectly legible, thanks mainly to a sensible choice of screen colours and text font.

CAPTURE BUFFER MODE

Capture buffer mode presents you with a GEM screen, so permitting mouse and menu control. Its simplest function is to give you a window onto the capture buffer. This is a large area in memory into which you can choose to automatically store anything appearing on the terminal mode screen (either keyed in by you or received from the remote system). You can switch into capture buffer mode at any time and view anything that has scrolled off the terminal screen.

But capture buffer mode gives you much, much more than this. It has built-in word processor-like facilities, allowing you to create, edit, and save or transmit all or selected parts of the buffer, those parts being defined by block start and end facilities. You can then save, delete, print, transmit, copy, move, or even append a block to an existing file. There's also a search feature, permitting you to quickly locate a specified character string in the buffer. And you can insert an existing file into the buffer at the current cursor location. All this gives you fantastic flexibility for offline preparation of items for transmission, saving you money on expensive connect time and phone charges.

Capture buffer mode is also used to customise FLASH for your own use. It has facilities for setting up one or more 'dial directories', which hold the names and phone numbers of your favourite bulletin boards and services. Assuming you have an autodial feature on your modem, dialing a service is reduced to a couple of mouse clicks. Obviously, different services have different terminal configuration requirements, so FLASH allows you to define configuration files and load them in when needed.

AUTOMATIC

Probably the most impressive features of FLASH are its built-in automation facilities. Rather than key in commands singly, you can batch them together in 'DO files' using capture buffer mode facilities, so they look like a program or macro. They may then be saved on disk and executed when required via the DO command. DO files may be nested to three levels, giving the potential for some pretty fancy processing.

A DO file can be linked to a phone number in the dial directory, and is executed automatically following successful connection with that number. You can also arrange for a DO file to be automatically executed immediately following boot-up.

The DO file can contain a mixture of FLASH commands, modem commands (for intelligent modems) and data to be sent to the remote system. You can also perform such things as redial of engaged numbers, test for character strings received from the remote system, pause for a specified time interval, wait until a specified time, and many other useful functions. It's possible to completely automate an online session, for instance to dial a service at a given time, log on, look for your mail, download it, save it to disk, log off, and sound a bell to tell you it's finished. I've tried many of these functions and they all seem to work. Now I know why it's called FLASH!

Another way of automating FLASH is via programmable function keys. You can define up to 20 of these, each one having a string of characters assigned to it. These can be FLASH commands, or anything else you want. The manual wasn't clear on maximum length allowed, but it appears to be

around 80 characters. If you need a longer length you can link function keys together using a 'GO function key' command as the last part of a given function key string. The end result is that you can input the whole character string in terminal mode by pressing just one function key – very useful for log-on sequences, for instance. The definitions may be saved to disk and loaded in whenever required.

BULLETPROOF ...

FLASH is advertised as having 'bulletproof' file transfer facilities. It handles ASCII or XMODEM transfers directly to/from disk, and has facilities for varying parameters to suit a wide range of remote system requirements. I can't verify it is bulletproof in all circumstances, but it has certainly worked successfully on the downloads I've tried so far.

Another feature worth mentioning is FLASH's translation table facility. This allows you to do such things as access bulletin boards designed for specific non-Atari machines, and to handle any strange control characters which might otherwise drive your Atari crazy. Another use would be to implement a simple form of encryption/decryption between two FLASH users having the same translation table, i.e. a basic security system. Translate tables, like all other customisable features in FLASH, may be saved to disk and loaded in as required.

IN CONCLUSION...

My overall assessment of FLASH is that it's an inspired piece of programming. It's reliable, easy to use, offers useful features rather than gimmicks, and sells at a reasonable price.

The main fly in the ointment is that it doesn't support PRESTEL type systems. However, it works OK in V23 mode (1200/75 baud) on text only systems – at least, it does with my Miracle WS4000 modem. The other (admittedly esoteric) missing feature is the ability to handle auto-answer – you can't dial into your own system from elsewhere to access or upload your own files. However, Antic have recently released an accessory package which adds exactly this feature and much more besides. If they could do the same with PRESTEL type support, FLASH would be unbeatable. But if you don't need this, it's a winner anyway! •

K-ROGET
Kuma Software
£49.95

Reviewed by Matthew Jones

For many years I have had by my desk both a dictionary and a thesaurus for when I am writing. Every so often, I find myself thinking 'is that really how it is spelt?', but even more often, 'there must be a better word'. A thesaurus is a dictionary of synonyms – words with similar meanings. The thesaurus I have is small, never seems to have the word I require and it takes time to search for more alternatives. I have always thought that this was an obvious task for my computer.

K-Roget, by Kuma, is designed to provide just such a facility. I started eagerly by reading the 18 page manual but soon became lost as it switched from topic to topic so let me try and give you an idea of the program without the manual. K-Roget is installed as a Desk Accessory. To select a word, you select the K-Roget option in the desk menu and then type in your word. If you have K-Word 2, you can use a menu option to send the current word to K-Roget automatically but this option is not available with other software. K-Roget will search its files, and produce a list of similar words. Three slider bars allow access to more words, the top bar selecting alternative references (e.g. broadside is in with synonyms like flank, salvo and great gun), another bar selecting different paragraphs about the current reference, and the third selecting new 'heads'. The 'heads' next to that located for you are generally related to the subject. For instance the 'heads' next to 'untruth' are 'truth' and 'maxim', followed by 'absurdity' and 'ignoramus'.

You can move around in the subject you are interested in quite easily. Another nice feature is that some of the suggestions are multiple words, e.g. 'scholar' has the suggestion 'man or woman of letters' and 'academic circles'. If K-Roget cannot find the word you are looking for, it lists words that are spelt similarly, so you do not have to know the precise spelling to use it.

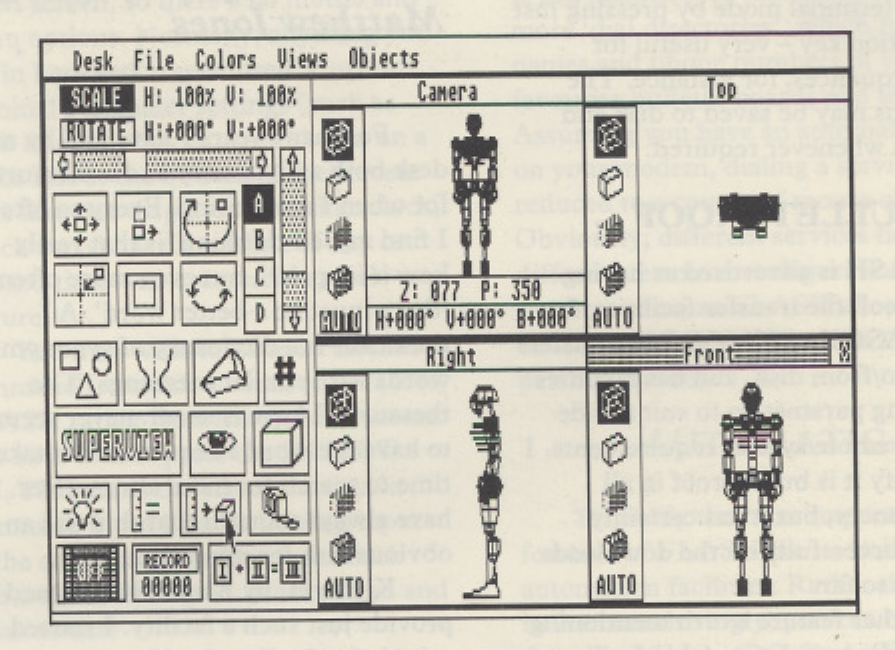
Once you find a word, you can find more alternatives by clicking on it in the window to select it. Also available is an history feature, which allows you to see all the words you have looked at in this session. If you are using K-Word 2, then you also have the option to send the current word to replace the existing one but with other applications you will have to note the word and insert it manually.

I have recently used the new Wordstar Professional 4 which comes with Word Finder and is, to my mind, very much easier to use than K-Roget, but is harder to look around similar subjects. I find the controls of K-Roget frustrating, as the slider bars are not fully implemented (you can drag, and click on arrows at the end, but not click on the shaded part) and you cannot double click to select and find a new word.

The manual is adequate but a bit of a struggle – everything you need is there but it seems very disorganised – but once you have the program installed and can understand the terminology, use is intuitive. K-Roget needs two 1 megabyte disks or a hard disk, or a RAM disk, (though it is supplied on three single sided disks).

Overall, K-Roget provides some good alternatives to most words, and if you do any writing, it is well worth looking at. •

CYBERSTUDIO



Has ANTIC Software developed the ultimate ST Graphics package?

Cyberstudio CAD 3-D may be the most advanced of the many graphics packages currently available for the Atari ST. It is a program which allows one to draw 'flat' two dimensional shapes and objects and transform them into 'real' three dimensional objects with depth. For those who may have logged a few dozen hours on the original CAD 3-D (version 1.0) there should be little difficulty in adjusting to the new version. Version 2.0 requires one megabyte of RAM therefore if you own a half-megabyte Atari you will need a memory upgrade in order to use this program. It's not an unreasonable suggestion, for this program it's worth buying a memory upgrade!

CAD 3-D 2.0 is an 'object-oriented' graphics program which allows one to create three dimensional drawings and place them in a three dimensional universe. CAD 3-D creations may also be output as screen images and saved in either Degas, Neochrome, or C.O.L.R. Object Editor formats. They may even be printed as hard copy. Then, using the Cybermate animation/ editing program, which is included with CAD 3-D 2.0, groups of sequential frames can be created and your objects can move with smooth animation. Using the optional new Stereotek Liquid Glasses, objects may also be viewed in breath-taking stereo.

When the program is first booted-up we see the familiar drop-down gem menus across the top of the screen. The left third of the screen is the ICON CONTROL PANEL and the right two-thirds of the screen consists of the four VIEW WINDOWS which are used to look at the 3-D Universe. The CAD 3-D Universe is a transparent cube and all objects created by CAD 3-D appear inside the cube. The windows labelled TOP, RIGHT, and FRONT (which can be flipped to BOTTOM, LEFT and BACK) correspond to the various faces of the cube. These windows are fixed and cannot be moved, unlike the fourth window which is labelled CAMERA. The CAMERA window is like an actual movie camera on a 'boom' located outside the universe's cube. It is able to move to any position – near, far, over, under or around.

There are three ways to begin to create an new object. The first way is to use the PRIMITIVES ICON. It allows you to create basic shapes and offers you the choice of SPHERE 1, SPHERE 2, SPHERE 3, TORUS, CUBE, or WEDGE. You may also choose to create an original object through the EXTRUDE or SPIN functions. EXTRUDE operates like a

> 'worth buying a memory upgrade'

jigsaw, allowing a shape to be cut out as if you were cutting a shape from a piece of wood. After Extrude cuts the shape, it adds depth. You can then alter the thickness and size using the scaling tools. SPIN creates an object of revolution as if you were to create it by using a lathe. After the outline of an object is drawn on the Spin screen, it is spun to create depth.

When using Spin or Extrude you are brought to separate work screens. These work screens contain their own sets of drop-down windows which provide tools to aid in producing objects of greater accuracy. Once an object is created it can be rescaled, manipulated or placed in a group of one or more other objects as a single element of a greater construction. After your object is created the ROTATE and SCALE slider bars at the top of the screen allow you to rotate your object (or objects) either vertically or horizontally and then scale them to be either smaller or larger.

Using the camera window, you can ZOOM in or out, change the PERSPECTIVE or ROTATE the camera. These functions only affect the camera's point of view and don't change the actual objects. Using the OBJECT JOIN icon, you can join objects together in a variety of ways to create a third, unique, object.

The next set of icons allow for moving objects within the 'cube' universe. You can DRAG objects to any location within the non-camera windows as well as reposition them in relation to any other object. You can also rotate objects in three different ways. Center Pivot Point Rotation is used to rotate objects around the imaginary center point of the 3-D universe, Group Pivot Point is used to rotate objects around an imaginary point in the center of the object, and Arbitrary Pivot Point allows one to rotate objects around any selected point

within the 3-D universe.

There are also separate Icons which allow even more precise control over changing the positioning of objects, their size or their relationship to one-another on the screen. Double clicking on the SUPERVIEW icon creates a full screen, 16 colour, low resolution display of the CAD-3D composition from the same view point of the camera window. It is this image that is used when you elect to save to Degas, Neochrome or C.O.L.R formats.

A new feature in superview mode allows you to use the mouse to rotate, zoom, change the perspective, or bank the camera angle, in real time while the image shown in superview is in wireframe mode. Clicking once on superview brings the super view mode setting menu to the screen. It allows you to load a Degas picture into the background, display the image in stereo for Stereotek glasses, change the images from object oriented to a pixel image background and change the mode of the colour image displayed.

All objects which are displayed are affected by lighting. By clicking on the LIGHTING icon a control box appears which allows you absolute control in position and intensity of three different light sources and an ambient light. The ESTABLISH SCALE icon allows to choose a scale of measurement to use later with the OBJECT MEASUREMENT icon and the TAPE MEASURE ICON. With the Object Measure icon, you can rescale an object by editing it's length, width or height and with Tape Measure you can measure the distances between icons. The final icons control the animation facilities which record sequential image files for plotter/ GDOS output or animation files for the Cybermate system.

Cybermate is an advanced language which animated CAD 3-D 2.0 creations. Using advanced delta compression techniques, Cybermate transforms a one megabyte ST into a ten megabyte frame buffer. Thousands of animation frames of 3-D objects can be stored in RAM and played back at speeds up to sixty frames a second (2½ times faster than a film).

Cybermate also allows the addition of sound effects or music (created by the very competent G.I.S.T Sound Editor) to the 3-D films.

CONCLUSION

CAD 3-D 2.0 is exceptional value for money, it's an incredibly advanced and useful graphics program made as user-friendly and convenient as possible.

Creative use of CAD 3-D can design impressive logos, breathtaking special effects in film or video, brilliant images for use with Degas or Neochrome, well designed 3-D sprites, as well as many other inventive uses. CAD 3-D 2.0's restrictions appear to be only the bounds of the user's imagination.

Zoomracks II

John S Davison takes a look at the latest version of one of the most original computer databases

Zoomracks, the innovative database program for the ST, first appeared over a year ago. Its flexibility and unique visual interface based on the idea of cards in racks (like those used by employees for clocking in and out at work) made it very easy to use. Now Microdeal are marketing a Mk II version offering even more facilities. They've also launched a companion series of 'Starter Kits' designed to get either version of Zoomracks into productive use in double quick time.

Zoomracks II is supplied in a substantial A5 ring binder containing a command reference card, a function key template, a single sided disk, and a fully indexed 150 page User Guide. The Guide's tutorial style is designed to get you using the package quickly, and the disk contains online tutorial and help facilities for use if you get stuck later.

The program is driven mainly by menus appearing across the bottom of the screen. Selections operate as 'toggles' – making a given selection a second time reverses the action of the original, returning you to your starting point. Selections may be made with keystrokes or by positioning the cursor over the required item with cursor keys or mouse. Certain features are implemented via function keys, which can be a little confusing until you're familiar with the program.

A card holds up to 27 data fields, each up to 250 lines by 80 characters long. Each card is held in a slot in a rack with just the top line showing, so you can see what it contains. A rack can hold thousands of cards, with actual capacity depending on the amount of data on each card and your ST's memory size, as a rack has to fit completely into memory. A gauge at the bottom of the screen shows how much free memory remains at any time.

A rack may be named and stored on disk just like any other file, but with an extender of ZRX. When requested, Zoomracks displays the rack names – in a rack, of course! So the overall Zoomracks database structure is as follows: a disk is a rack of ZRX files, a ZRX file is a rack of card records, and a card is a rack of data fields.

CREATING A DATABASE

A rack is created by defining a 'template', which names and positions the card's data fields. Field type and length don't have to be specified, as all data is ASCII, and the length is.... well, as long as you want it! The template generates blank cards into which you simply key the data (of any length) when prompted by fieldname. This is repeated until all required cards have been set up. It's unbelievably easy!

Zoomracks II's editor has a number of wordprocessor-like facilities to help you enter and edit data. In fact, you can use it like a simple wordprocessor for producing notes and letters. Input mode is switchable between insert and overtype; you can delete data by character, word or line; there are cut, copy, paste and replace facilities at rack, card, field or line level; margins can be adjusted and text reformatted to fit; lines can be split and joined at any point and tabs can be set. Also, there's a facility for pasting current date and time into a field.

RETRIEVAL AND UPDATE

Data retrieval is where the 'zoom' part of the program's name becomes evident. You use the program rather like a zoom lens on a camera, in this case to get closer and show more detail of your subject data. After loading a disk you select a rack from the displayed disk rack. This rack then loads and zooms you into rack level detail, showing the top line of each card in the rack. If you then select a card the program zooms you into card level detail, showing individual data fields. Finally, if the field holds more data than actually shown on the screen, you can zoom in again to display the whole field.

If a rack, card or field is too big to fit on one screen you can scroll up and down to find the part you want. Unfortunately, Zoomracks isn't GEM based so there are no scroll bars. Scrolling is performed by different methods depending on the current zoom level – very annoying in practice.

With many database programs, making changes to an existing database can be a painful experience. Not so with Zoomracks. You have complete flexibility to change field positions, add/delete fields, and alter the amount of data displayed for each field, as well as altering its length or content. And if you mess up the format changes there's an 'Undo' command to put everything back as it was. Cards may be added and deleted easily, too.

Up to nine racks may be loaded into memory at any one time. You can quickly switch between them, or even display multiple racks on the screen simultaneously, with Zoomracks automatically compressing the data to make this easier, if required.

MATHS AND MACROS

Zoomracks II's mathematical capability is restricted to the four basic arithmetic functions. You can use it like a calculator, with numeric data input from the keyboard or picked up from any field on the card. A semi-automatic mode permits the summing of all numbers in a field or the same field across cards. Results may be put back into the card if required. Further automation may be obtained using the macro facilities described below.

A macro is a collection of commands or frequently used text which can be set up in a special macro rack and invoked by a two key abbreviation. The rack holds up to 27 macros, and may be saved for future use. A disk may hold multiple macro racks, but only one may be loaded in at any given time. Creating macros is very easy – the first one I tried (admittedly a simple totalling operation) took about 30 seconds, and it worked first time.

Macros operate on single cards or a specified number of cards from a given starting point – you don't have to process the whole rack in one go. Zoomracks can also automatically load a default macro rack and even execute a specific macro at boot-up time. A simple macro language is included to help you produce quite slick macro procedures, as demonstrated convincingly by the online tutorial supplied.

PRINTING

Zoomracks can print to a screen for checking layouts, a printer for hard copy, disk (in ASCII format) for input to other programs such as a wordprocessor, or internal field buffer for pasting elsewhere in the database.

Print layout is specified by the use of 'forms', allowing you to customise the printout's appearance. A default form (same as the card layout) is automatically provided, and this may be edited to produce your own customised version. Page layout parameters such as page length, margins, offset, headers, footers, page numbering, and datestamp may be specified as well as positioning of fields anywhere on a page. Data may be printed one card per page or as a continuous report. It's not quite as sophisticated as some database programs, but adequate for most purposes.

CONCLUSIONS

Zoomracks II represents a refreshingly different approach to ST database applications. Once you've mastered its quirky mix of keyboard, function key and mouse input it becomes simple to create, use, and maintain many basic home or business applications. A quick look at the contents of the Starter Kits should give a good idea of what's possible.

For more advanced applications its limitations in the search, sort and arithmetic areas could cause problems. Also, I found the lack of disk utilities a pain. You can't even list a complete disk directory from within Zoomracks – the disk rack facility shows only Zoomracks files! But having said that there's still an awful lot it CAN do. In fact, it could well be the only database program you ever need. •

ZOOMRACKS STARTER KITS

If you're a Zoomracks user and can't spare the time to set up your own database applications, then these inexpensive starter kits from Microdeal at £9.95 each could be just what you need. Basically, they're sets of Zoomracks templates, sample data, macros, output forms and hints files which you can load and use straight away. They're designed to work with Zoomracks I or II.

Each disk holds a large number of different application racks, with each rack being pre-loaded with a few sample data cards for that application. You build on these to form your own customised databases.

Each rack includes a comments card describing each field in the supplied template for that rack. If a template doesn't quite fit your requirements, the amazing flexibility of Zoomracks allows you to immediately add to, delete from, or otherwise modify it – even though it already contains data.

Having a database doesn't necessarily mean you've got a usable application. You need to be able to rapidly manipulate the data, produce reports from it and maintain it. This is where the supplied macros and output forms come in. Once again these may be modified and your own added until the applications are exactly as you want.

If you put all the home applications on your ST you'd spend all your waking hours updating them! Still, they give ideas of what can be done, and all of them are probably useful to someone, somewhere, sometime. The ones of interest to me seemed to work OK, and were adequate for their purposes. In addition to the templates there are 43 output forms provided for producing reports and listings from the different racks, but only three macros.

There's a lot in the Business Starter Kit also with most of it looking suitable for general office use or at least providing the basis for developing your own applications. Some areas (such as Invoicing, for instance) would probably require considerable modification to meet individual needs. The kit also includes 47 output forms and 10 macros, the latter handling such tasks as adding items and calculating the remaining balance on an invoice.

Overall, I think the Starter Kit concept is excellent. Not only does it provide ready made applications for your ST, but it could also give you ideas for using your ST in ways you'd never previously dreamed of. At £9.95 each the kits are great value and I'm sure all Zoomracks owners will find something in the series to interest them. •

HOME STARTER KIT

Contains templates for:

Appliance Records
Appointment Calendar/Diary
Book Catalogue
Checkbook Balancing
Clothes Sizes
Computer Disk Index
Cookery Recipes
Cookery Recipe Index
Correspondence Log
Credit Card Details
Family Contracts
Family Health Records
Freezer Inventory
Fruit Canning Records
Gift Log
Home Inventory
Information Sources
Investments
Items Loaned Log
Names and Addresses
Newspaper Clipping Index
Pets and Vets Log
Phone Call Log
Prescription Log
Record Catalogue
Restaurant Log
Sewing Index
Shopping Lists
Special Offer Coupon Log
Storage Log
Subscription Log
Videotape Catalogue

BUSINESS STARTER KIT

This one includes templates for:

Appointment Calendar/Diary
Area Codes (USA)
Assets
Cheques
Company Details
Correspondence
Customer Details
Customer Orders
Employee Records
Expenses
Inventory
Investor List
Invoices
Meeting Agendas
Memos
Names and Addresses
Office Files Index
Office Forms Catalogue
Office Procedures
Payables
Payroll Details
Phone Log
Price Lists
Prospect List
Purchase Orders
Shipping Log
Things To Do List
Vendor Quote Details

GFA BASIC COMPILER Glentop Press Ltd.

Reviewed by Matthew Jones

THE BASIC

As a programmer who learnt the BASIC language many years ago but then left for the brave new world of C, the opportunity to review GFA BASIC was an interesting chance to see what BASIC has been getting up to since I left.

GFA BASIC comes in a video cassette style box, and includes a 293 page ring bound manual and a single floppy disk. The disk contains two versions of the BASIC (both unprotected – please don't abuse), a full featured one for program development, and a run-only version to allow you to give away or sell your programs.

IT DOESN'T USE GEM!

Being a normal user, the first thing I did was not study the manual but run the BASIC program. I have had my ST since the first shipment hit the U.K., and since then have become very familiar with the GEM interface, using windows, icons, menus and mice. When I ran GFA BASIC therefore I had quite a shock. GFA BASIC is a *standard text mode program*, though it does use a mouse. I fully expected to find GFA BASIC using windows, but having used it for a while, I have to admit that even without windows, it still presents a good environment to work in. GFA uses a 'Command line' menu at the top for mouse selections which is similar to a drop down menu but nothing drops down! There are ten options, doubled up to make twenty. Clicking on the command text, or pressing a function key (shifted for the extra ten), activates the command. Commands include load, save, run, program check, search, replace and block functions, as well as options like insert and overwrite mode toggles, and (on monochrome screens) a 50 line mode.

The BASIC program is not entered in the traditional form with line numbers, but is entered with one command to a line and automatically 'tabbed' within loops (GFA is a procedural BASIC, also incorporating DO...LOOP, REPEAT...UNTIL and WHILE...WEND). A nice touch is that keywords can be differentiated by automatically capitalising the first letter. I did miss a scroll bar to reflect the current position within the program and to provide easy movement to anywhere in the program, but for those who do not like GEM, this may be not be a problem.

IT DOES USE GEM!

GEM is not neglected by the program though, for whilst the programming environment is not GEM based, very good provision has been made within the commands for incorporating GEM into a user's program. As an example, it is possible to define an array of text strings, which can then be used with a command to build a proper GEM menu bar across the top of the screen. Activating the menu is then just a case of using the command 'ON MENU GOSUB'. The user must know a bit about the GEM system, but other commands allow much more transparent access to GEM facilities, like the window commands, and an alert handler. So the programmer who wants to use GEM is not held back by GFA (an interface to the heart of GEM is provided if you want to sidestep or enhance the standard facilities).

GFA BASIC is not just about working GEM however, as a lot of new and useful functions have been added to make programming in BASIC a lot easier and more powerful. I cannot include them all, but for a few examples: access to the address of a variable, and passing of pointers to procedures; single operand maths functions like ADD A%,5 (which is twice as fast as LET A% = A% + 5); graphics primitives (lines, boxes, circles, ellipses); chaining of other programs; date and time functions; structured file read/writing and random access files; PRINT USING; form inputs (limiting input to a set length); local variables in procedures; reading of all mouse actions (x,y, buttons, leaving/entering boxes); sprite definition; sound command; upper/lower case of a string; blitter type block moves; screen save/restores; an 'approximately' equal to comparison; and both user and supervisor mode POKE functions (byte, word and long sized) for twiddling within the computer. I can't cover them all here, and I haven't included the more basic (no pun intended) functions that have been added. Overall this is a function packed BASIC.

THE MANUAL

Considering the number of functions and the general power of GFA BASIC, it is a great pity that it is let down by the manual.

Despite its size, and at least one page per command, it does not give as much information as I would have liked, and it is often not very clear, partly because of its (obvious) German translated origin. Another point is that it has been printed on a bright red paper, a technique used to stop photocopying. I tested this and found that with a bit of experimentation, the photocopy was easier to read than the original manual! Glentop told me they were doing a new manual, and may be dropping the red paper. I hope that existing owners will be able to send back their manual with a SMALL fee to upgrade to a new one. At the current time, the manual is a disappointment, but it does contain all the information – you just have to spend a long time finding it as there is no index.

CONVERTING PROGRAMS

My experiments with the system included an attempt to convert an old 8 bit Atari BASIC program ('Matthews Label Maker') to run on the ST. GFA provide a program which converts Atari ST BASIC programs (with line numbers and multiple statements per line), and converts it to a file suitable

for GFA BASIC (single command per line, using labels in gotos). After a few unsuccessful runs (the program picks up on FORs in REMs), the program was in a form suitable for reading into GFA BASIC. It seemed too good to be true, and was, for my original program seems to have had some convoluted system of conditional NEXTs in it, and I got a 'procedure in a loop' error, which meant I was totally unable to use my original (I can't remember how it works any more!). This may not be typical though, and if I were to write it again today, I would make much more use of the structuring capability of languages like GFA BASIC.

A set of public domain programs for GFA BASIC is also included, which really show off the program to its best. Some are quite astonishing (for instance an animation of a horse by blitting), and if I hadn't run them myself I might not have believed they were written in BASIC (and interpreted BASIC at that). More GFA BASIC programs are available from other public domain sources.

THE COMPILER

The separately bought compiler comes in the same style box, with a 31 page manual and disk. Compiling is very simple. A dialog is presented which shows the possible options, and when you have chosen you select a file to compile, then a file to save it as, and then it is done. Simple as that. The available options are: whether the program can be stopped by pressing the Shift/Alternate/Control keys together (and how often checks are made for them); whether integer overflow will be trapped; whether run-time error messages are text and number or number only; whether bombs are to be trapped (e.g. erroneous instructions which cause three bombs can be stopped and made to create an error 103, and thus detected by ON ERROR GOSUB). All the options can be specified in the source code if desired.

Only a few commands cannot be compiled, and they are only because they are not applicable (like LIST and SAVE). No separate compilation is possible, so it is not possible to split your code up into smaller files, but this is not too much of a drawback. The only requirement for distributing the compiled code is that you acknowledge GFA BASIC.

CONCLUSION

GFA BASIC is a very capable programming system, and would be quite suitable for any level of programming, from beginner to very advanced. It is a pity that GEM is not used when writing programs, but not having it probably contributes to the claimed interpreter size of only 55k, and the program is quite usable anyway. The only drawback to GFA BASIC is the manual, but this may be replaced soon. The compiler is a nice option, but with the run-only version of the interpreter supplied, only the commercial user will need it as the interpreter does a very fast job on its own. If GFA BASIC is representative, BASIC has come a long way in the last few years.

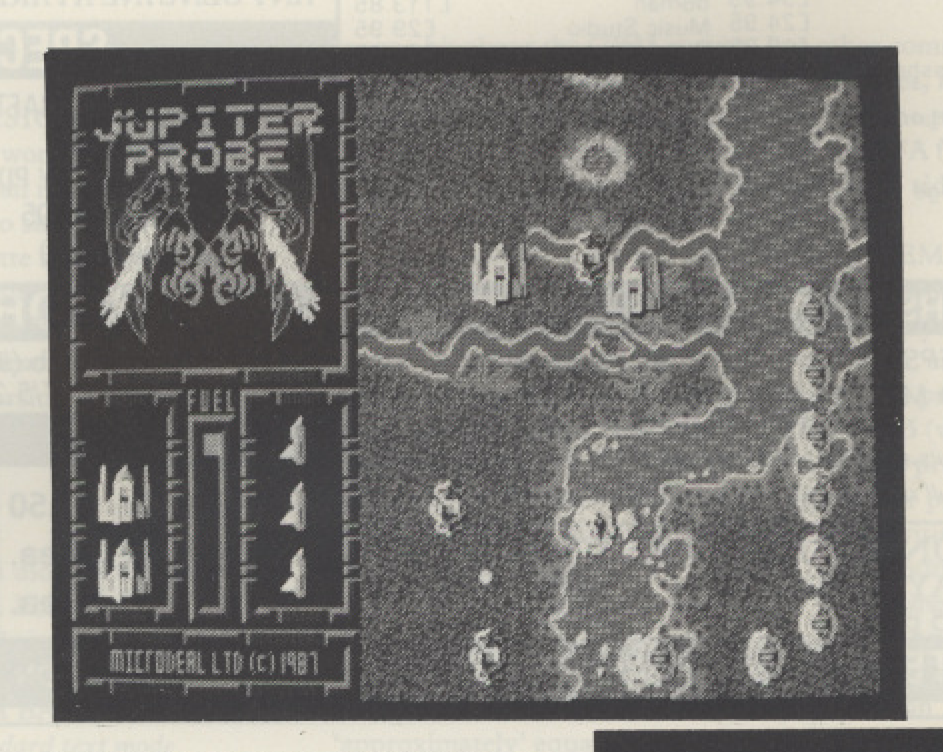
GFA BASIC interpreter and compiler cost £45.95 each, and are available from: Glentop Press Ltd, Standfast House, Bath Place, Barnet, Herts, EN5 5XE •

YOUR MISSION IS.... SHOOT EVERYTHING!

more games for your ST

JUPITER PROBE
Microdeal
£14.95

Reviewed by John Davison jnr



Your mission in Jupiter Probe, the latest release from Microdeal is to fly above the surface of Jupiter sending back photographs. However, a hostile race of beings whose only desire is to destroy Earth is trying to stop you from discovering the dark secrets of Jupiter.

The mightiest powers on Earth have united and supplied three scout ships with which to scour the surface of Jupiter. These ships are equipped with twin laser cannons and a limited number of 'advanced features'. These advanced features are Ultrasonics, which cause a disturbance in the area around your ship, thus destroying all aliens in your vicinity, and Shields which protect your craft from enemy fire for a short period of time.

As you can probably tell from the above, this is yet another shoot 'em up game. In fact it is very much like many other games of this type. Vertical scrolling, nice bold graphics, neat soundtrack, lots of aliens and plenty of action. Considering this game is 'yet another vertical scrolling shoot 'em up' it does have a surprisingly impressive pedigree. It was programmed by Steve Bak who was responsible for many superb games including Goldrunner and Karate Kid II.

The graphics were done by someone I've not heard of before, Chris Kew. Now don't get me wrong, they're good but there's just something not quite right about them. The many craters, mountains, rivers (on Jupiter!!!?) and ground bases are all well drawn and very colourful, however they appear to be very 'chunky'. They're good, but on the ST I expect something a little better.

The sound is, in most respects, excellent. Like many other games at the moment, Jupiter Probe contains sampled speech, however it is not very clear and only says a few things. The speech warns you whenever a formation of aliens or a mutant space craft (one which can't be destroyed by the Ultrasonics) is approaching. It also tells you which advanced features have been awarded at the appropriate moments. The Jupiter Probe theme music was written by Rob Hubbard, and is considerably better than his last attempt on the ST – Goldrunner.

The game is very playable as it is just about the right difficulty level for most people, making it fairly hard but not impossibly so. Control is with either mouse, joystick or keyboard.

Jupiter Probe is a good value for money game, the price (£14.95) being something which I hope to see more often from both Microdeal and other software companies. •

'a good value for money game'

LIBERATOR
Microvalue/Tynesoft
£12.95

Reviewed by John Davison jnr

Liberator is yet another vertical scrolling shoot 'em up at a reasonable price. This time your job is to "search the five Colonial prison planets and free the Federation refugees who are being held captive by the rebel Altarian Storm Troopers and androids."

Before loading the game I was not really sure what to expect. I read through the instructions, which incidentally are a bit longer than your average MicroValue instructions (almost a whole side!!!) and discovered that it really was just another shoot 'em up. You must guide you T.H.G.C. (Tactical Hover Gun Craft) through the enemy controlled terrain and liberate the imprisoned Federation members. Basically what you have to do is to shoot at all of the aliens that descend on you from all directions, and hover over large ammo boxes to

CRAFTON & XUNC

ERE/Infogrames

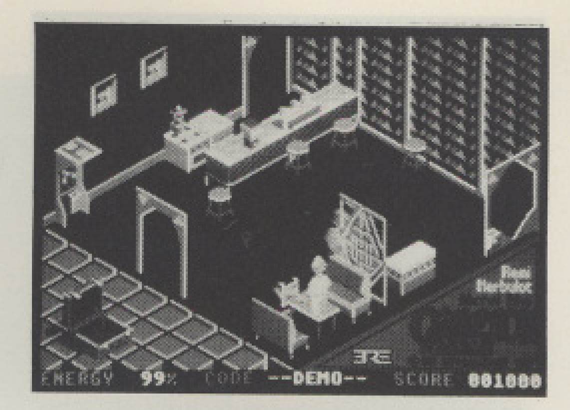
£24.95

Reviewed by John Davison jnr

The year is 2912 AD and the possibility of a global war breaking out on Earth is high. All of the spatial colonies are threatened, and if the Central Galactic Control Computer is destroyed all life will disappear on the dependent planets.

You play the part of Crafton, an Android who specialises in dangerous missions and you are accompanied by Xunc, a creature known as a podocephale who is like a head sitting on top of a foot. Your mission is to penetrate the research centre protecting the Control Computer and avoid the catastrophe. Well, there you have the basic story behind the game.

In play, 'Crafton & Xunc' is fairly good. The screen layout is similar to that of many arcade adventures, showing the proceedings in 3D. You view each of the many rooms within the



research centre from above one of the corners, making the room look like a diamond shape. The rooms each contain many objects, such as tables, chairs, settees, plants and usually something hostile, be it alien robots or green haired punks! All of these objects are very colourful and well drawn, thus giving the game a very pleasing look.

The sprite which you control is fairly well defined, as you can see all the major features such as his face, arms, legs and his red bobble hat wobbles about when he walks. 'What!?' you may well ask, 'an Android wearing a bobble hat!' Yes, Crafton wears the bobble hat to cover up his topless head. According to the comic book which accompanies the instruction sheet, Crafton's skullcap was misplaced, and then eaten by Xunc your (faithful!?) companion. But enough of that, it is not really important to the game.

As you roam about the research centre you will come across many different objects (as mentioned above). Most of these objects are movable, so moving cupboards away from walls can sometimes reveal hidden doorways. Also, hostile robots which chase you around can be trapped by cutting off passageways with tables or chairs. In addition, you will meet a few people during your exploration, including green haired punks and various blonde haired women, who will do their best to stop you doing any more exploration. Furthermore, there are some ancient looking scientists who must each be interrogated to obtain part of a secret eight figure code, which will eventually give you access to the central computer.

The sound in 'Crafton & Xunc' on the whole is not bad, the music at the beginning is fairly catchy, and the sound effects throughout the game are above average.

Overall not a bad game with some nice touches and new ideas, although I do think that it is a little overpriced. ●

replenish your supply of 'bombs'. When you eventually reach the prison cell you must shoot out the cell gates to release the prisoners. You must then teleport to the next planet avoiding the 'Time Space Gates' (at least that what the instructions say, I've never actually seen the Gates).

The graphics in Liberator aren't bad, but as with many of the budget games they are not amazing. As you fly above the surface of the planet the rather dull background scrolls by fairly smoothly. I think that possibly the most graphically impressive things in Liberator are some of the alien creatures. Each sprite, although not very well animated, is very well drawn and extremely colourful, especially the large spherical orange aliens which look suspiciously like the old 'Corona' adverts on TV.

The sound in the game is fairly bad. There is a pretty awful multi voice background tune, which fortunately can be turned off and some puny sound effects which aren't really worth mentioning.

Liberator isn't bad, but it isn't a game I would rush out and spend thirteen pounds on. ●

TEE UP

Anco/Artworx

£9.95

Reviewed by John Davison jnr

Tee Up is a game with an identity problem. The box claims to be 'TEE UP from Anco' and the title screen of the game claims to be 'HOLE IN ONE from Artworx'. Oh well, never mind.

Tee-Up, as you can probably tell from the title is a golf game, and to be quite honest, it is not very good. When most ST owners think of golf games the first to spring to mind are 'Leaderboard' from Access/U.S. Gold or 'Mean 18' from Accolade. Well, Tee-Up is absolutely nothing like either of these. No flashy animation or three dimensional graphics here! Your view of the proceedings is from above (a very long way above) and you cannot actually see your golfer, just the ball.

Each hole is one screen in size and usually has a good scattering of trees and water. I say usually because that is only in the eighteen holes provided on



the program disk. It is possible to create your own holes with the supplied construction kit. The 'fairway editor' as it is called, is possibly the only redeeming feature of Tee-Up. Creating a hole is just like painting a picture. You can have different sized brushes for drawing the water, rough, sand, fairway and green, and you have preset shapes for the various trees, etc. The different holes you create can all be saved out to disk so you can make up your own course or copy real courses.

Apart from the construction kit, I can't really say much more about Tee-Up which is positive, other than the fact that it is cheap. I don't really think it is really worth trying to save a few pounds in this case, if you want a good golf game save a little more and buy either Leaderboard or Mean 18. ●

TNT
Infogrames
£24.95

Reviewed by John Davison jnr

TNT is the latest release from the French company Infogrames and is possibly their most impressive yet. Those of you who have played 'Commando' or 'Ikari Warriors' in the arcades or on other micros will probably feel at home with 'TNT' as it's a sort of cross between the two.

My copy was a pre-release version so I didn't get any documentation, and therefore I'm not sure what the ultimate aim of the game is, however your primary task would appear to be



to shoot, knife or grenade anybody who moves! Upon loading the game you are greeted by a reasonable picture of a soldier with the game logo. Accompanying this picture is a very good piece of music, in fact it is some of the best I've heard so far on the ST. The French composer, Charles Callet would appear to be perfectly capable of equalling anything which either Rob Hubbard or David Whittaker have produced and these are two of Britain's foremost computer musicians!

You move onto the first game screen, a very pretty swamp, drawn in some nice pastel shades. The swamp water appears to move slightly around the reeds, and then a large helicopter flies in from the bottom of the screen, dropping a lone soldier and then flying off. This lone soldier happens to be you! Selecting a machine gun using F1 you move on into the jungle, and suddenly enemy soldiers start running towards you from all sides shooting and lobbing grenades. You mow down a few with your trusty machine gun and then finish off a small group with a well aimed grenade. Continuing on you come across many more soldiers until eventually you reach the end of the swamp. The helicopter then picks you up and takes you to level two. The next level loads in revealing a jungle in the middle of the night along with another very good piece of music. In all there are four levels, each graphically more impressive than the previous one, and each level having it's own exceptional piece of music before you begin.

In the final version you will have five weapons, a machine gun, a rifle, grenades, a knife, and a flame thrower. You can only carry a limited amount of ammunition and grenades, so you must use your weapons carefully. The flame thrower can be used only once per level, however it was not implemented on my copy. I understand that on the production version it will act as a form of 'smart bomb', frying all of the enemy soldiers that are on the screen at that particular time.

The sprites in TNT are more 'in proportion' than those in other games of this type. Each soldier can be seen carrying his weapon and wearing camouflage gear, with a back pack and beret. My only complaint about the game is that the sprites sometimes flicker a bit.

The scrolling is superb, because whereas most scrolling games at the moment only scroll a relatively small proportion of the screen, TNT manages to scroll the full screen extremely smoothly. When I see scrolling of this quality it sometimes makes me wonder what other software companies must be doing!

TNT, looks, plays and sounds superb and I expect that the finished version with the simultaneous two player option should be even better. By the time you read this it will probably be out, so save your pennies!

PLUTOS
Microvalue/Tynesoft
£14.95

Reviewed by John Davison jnr

Yet another 'budget' release from MicroValue, this time it's a vertically scrolling shoot 'em up, and not a bad one either!

This game will be a right doddle to all the Goldrunner freaks out there, but it is still quite an enjoyable game. The graphics are quite good, showing the large mother ship you are flying over mostly in different shades of grey. On later levels you will fly over large framework structures and around built up areas casting long looming shadows. The alien attackers are each very well drawn, especially the circular shaped ships on which the shading changes as they rotate, making it look as if the light is just catching the flat area of the craft. All of the alien ships fly in formation and are very smoothly animated. The scrolling is very good, the huge mother ships move slowly by without any flicker whatsoever.

The sound in Plutos leaves a little to be desired. The few sound effects that exist are not terribly good but they serve their purpose. Some music might have been nice, though.

The main selling point of Plutos will be the fact that it is extremely playable. One of the main reasons for this playability is that upon losing a life you do not die. Instead, your small spacecraft becomes a 'shadow' (just an outline) and you may continue playing the game, until a few seconds later you turn back into your spacecraft again. This is a great idea, as with most shoot 'em ups it is most annoying to have to go back to the beginning of a level if you lose a life.

As with most games of this type, there is not much of a plot. Just a typical 'you must fly above the enormous mother ship destroying the weapons installations and the enemy spacecraft'. To finish a level in Plutos you must 'blind the Sentinel'. The Sentinel is the very last part of each mother ship, and here you must blast away at its eyes whilst it is trying to get you. If you fail, you will have to repeat the previous level, however if you succeed you will be awarded a five thousand point bonus, and you progress on to the next level.

Two player action in Plutos is simultaneous, i.e. both players are on the screen at the same time. Players cannot shoot each other but they must compete for fuel and points. This little feature makes two player games much more enjoyable, as you fight it out for the sparsely distributed fuel icons.

Overall, Plutos is a fairly good game with several nice little features not found in other games. I quite like it, but it's not amazing though, so check it out before buying.

More on page 52

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Hacker II
Activision
£24.99

Reviewed by John Sweeney

Hacker II starts just like Hacker. You are presented with a blank screen headed:

* H2-PLUS VERSION 1.0 *
LOGON PLEASE:

Never fear, it is even easier than Hacker to get logged on. In fact whatever you do you will be logged on and then interrupted by a message from the Director of Special Agents in the CIA, asking for your help to combat international terrorism by obtaining a copy of the 'Doomsday Paper' from a Siberian Military Complex!

Fortunately you don't need to travel to Siberia yourself – they have managed to infiltrate the complex with three MRUs (Mobile Remote Units – remote control robots really) which you can use from the comfort of your own home computer.

After a couple of screens of introductory information you are presented with the display you will use for the rest of the game. This consists of four small screens arranged in a square and taking up most of the screen, and a control panel at the bottom. Apart from a few keyboard inputs at particular places in the game all interaction is performed by pressing the buttons on the control panel. For this purpose they provide a small hand at the bottom of the screen which can be controlled by whichever input device you prefer – keyboard, mouse, joystick depending on your machine and your mood.

The four screens can be used to display a number of different views. You can look at the current view from any of the 38 cameras placed at strategic points in the corridors and rooms of the military complex. You can look at what either of the monitors is showing as they scan through all the camera views. You can look at a video recording of what any of the cameras recorded yesterday. Or you can get a bird's eye view of your MRU and the surrounding rooms and corridors.

The game takes place in real time. As the seconds tick away on the various on-screen clocks you can see the guard making his rounds, the monitor activating the cameras, your MRU as it passes in front of a camera, and the destruction of your MRU as it is turned into scrap metal by the Annihilator!

Your MRUs start in a safe room. You can take control of one and move it out to explore, but there are lots of ways of triggering alarms – the result is always the same – the Annihilator! Once you have worked out where you are and how to control all your systems be sure and get the annihilation scene up on one of your screens so you can view your demise.

The game has a number of stages. First you must master all the controls. The introductory screens give you a little help, the 32 page manual (Multi-Function Switching Matrix Operator's Manual Volume 1) will also help a little, but mainly you have to find out for yourself! Second you need to learn how to survive outside your initial safe room, avoiding the guard, the monitors and the annihilator. Third you need to map the complex. Once you have done all that, you can get down to the serious business of trying to solve the game!

Solving the game basically requires working out how to open the vault undetected. There are codes to crack and traps to avoid, and you are not helped by the fact that your equipment is faulty and breaks down bit by bit so that you end up having to drive your droid in the dark! You will need to understand ALL the controls on your Multi-Function Switching Matrix, study the introductory screens in detail, and work out how to manage with only four displays – to start with four seems more than enough but you'll soon wish you had more. Even when you think you have finished there is a sting in the tail which will keep you busy for another hour or two.

My only slight quibble would be with the price. I usually reckon I am getting my money's worth if it works out a a pound an hour or less. Maybe I was lucky in working it all out, but Hacker II cost me well over two pounds an hour. However I thoroughly enjoyed Hacker II and have no hesitation in recommending it to all thinking games players. One of its best aspects is its sheer originality. It is so refreshing to find a game which can't easily be fitted into any existing genre. ●

Shuffleboard/Pool
Diamond Games
£14.95

Reviewed by John Davison jnr

Two games on one disk for £14.95 on the ST! 'What a bargain!' you may think to yourself. Well, er, sorry fellas but this ain't really a bargain, because the games themselves seem to have something just not quite right about them.

POOL looks very nice, in fact the graphics of the table and everything on it look most impressive. There are plenty of options to choose from including loading demo games from the disk and changing the colour of the table. The balls are all animated very nicely and the direction algorithms all seem to be fairly accurate as the balls act almost exactly as you would expect them to. So what's the problem? Well, it's playing the game, and above all the control of your cue, as it's so difficult. The review copy I received didn't have any instructions with it so I had to work it out for myself. It would appear that first you move the cue up to the ball and rotate the cue around it (by moving the mouse left or right), then once the cue is in position you must pull back on the mouse to define the amount of power required, and then push the mouse forwards! You may be thinking, 'what's so difficult about that? Well just you try it! It's VERY difficult to get used to.

SHUFFLEBOARD, I am led to believe is like curling. The screen layout is very pleasing with a three dimensional view of the alley taking up most of the screen and an overhead view on the right hand side. Now, from what I can make out you have to slide weights down an alley (similar to a bowling alley) into scoring zones at the far end. If your opponent's weight gets in the way then you can knock it out of play. Whenever I play it I can't help thinking, 'well is that it?', and I always arrive at the same answer – YES! Shuffleboard isn't a bad game but I would imagine that the real thing is much more enjoyable than the computer version.

It's a pity really because these two games could have made an excellent package if Robtek/Diamond would had spent a little longer on them. ●

SUPER CONDUCTOR
Microdeal
£49.95

Atari's decision to fit a MIDI interface as standard to their computers has lead to the ST becoming quickly established as the premier musician's micro. Products now cover the whole range – from the full spec system used by top producers and musicians, down to simple programs for the novice.

Unfortunately most professional MIDI packages have a suitably professional price tag, whilst the low cost packages on offer tend to offer only the most basic facilities. Microdeal's Super Conductor is a MIDI sequencing package aimed at the low end of the market but with many features which are comparable with the more upmarket products.

TEN SONG BUFFERS

Super Conductor's first screen displays a list of the songs currently held in the ten song buffers. You can switch between these buffers with the function keys F1 to F10 at any time during editing. It is possible to play these songs in sequence which could be very useful for live performance or demos!

Whenever Super Conductor needs a reference to a position in a block or song, the Bar/Beat/Click format is used. Every bar of the song is divided into beats, and every beat is divided into 96 clicks. That is three times the resolution of the MIDI standard, so it should be good enough for most people!

RECORDING AND PLAYBACK

Unlike many sequencer packages, Super Conductor does not attempt to emulate a cassette recorder with the familiar 'PLAY', 'STOP', and 'FAST FORWARD' type buttons. Instead, Super Conductor takes advantage of the fact that most music is structured in some way; verse 1, verse 2, chorus, verse 3 and so on. These sections are called 'blocks' and you simply record a block for the chorus, and one for the verse and repeat them as many times as necessary.

A Super Conductor block contains any type of MIDI data including note events, aftertouch, controller changes, program changes and pitch bend. Normally, these events are accompanied by a MIDI channel number but Super Conductor removes the channel information when the track is recorded and so is able to reassign the MIDI channel on playback. Each of Super Conductor's sixteen tracks can be assigned to any of MIDI's sixteen available channels (confusing, huh?). It is possible to assign any of the channels to the internal speaker during playback if you should run out of synthesizers although the usefulness of this facility is restricted by the limitations of the ST's sound capability. Personally, I would happily forego this option in exchange for a metronome at playback since without one I found it difficult to decide how accurate the timing of my latest masterpiece was (or wasn't)!

Each track can be individually muted (silenced), but the program lacks a 'solo' facility to enable you to quickly listen to a track in isolation.

The Super Conductor editing screen displays sixteen bars which represent the contents of each of the sixteen available tracks. As blocks are entered into these tracks, you get a visual display of the structure of your song.

In use, I found it best to initially record very small blocks which could be later combined into larger groups as the song required. You can insert, delete and copy blocks simply be pointing to the required position and clicking the left mouse button – couldn't be easier!

EDITING

Super Conductor provides a comprehensive editing facility which enables you to examine and alter the MIDI data contained within a given block down to the finest detail. You are presented with a screen which displays, in chronological order, all of the MIDI events contained in a block. You can insert, delete and edit these events as desired.

Although the editing facilities are very thorough, many musicians are likely to be absolutely horrified by the sight of all those numbers. I can't help feeling that a graphical display such as that used by the Steinberg Pro 24 would have been a much better solution.

Paul Huggett takes a look at one of the most economical software packages for musicians. Can good Midi software be had at a reasonable price?

After a block is recorded, you can filter selected types of MIDI data, transpose it, and quantize it (correct it for timing errors). Quantization is a very useful tool which can make the difference between a song sounding just ordinary or being 'tight'. However, if you overdo it, you can easily end up with something that sounds stale and mechanical. The ability to filter data from a block can be especially useful if you have a keyboard which transmits after-touch information – which often wastes a vast amount of memory. Although these functions perform their designated task perfectly, they suffer from the disadvantage that they operate DESTRUCTIVELY on the data itself. Once you have quantized or filtered a block, your original data is irrevocably altered. The moral must be to save your data first!

DOCUMENTATION

Super Conductor is supplied with a comprehensive manual which does an excellent job of guiding the user through the program. It includes the complete MIDI 1.0 specification, an index and an appendix containing descriptions of all the possible error messages – all of which are very welcome.

VERDICT

There is no denying that this is a capable package. For a low-cost MIDI sequencer it provides a comprehensive range of facilities and good use of the GEM environment. On my wish list would be the ability to have a metronome click on playback – without one it is difficult to tell just how accurate your recorded performance was. I would also have liked to see the ability to synchronize with an external clock – without it synching to tape is virtually impossible,

A professional musician or producer would probably do better to look at one of the more upmarket packages such as the Steinberg Pro24 or the Hybrid Arts systems, but for the amateur, the simply curious or for those who lack deep pockets, I would not hesitate to recommend Super Conductor.

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Mr/Mrs/Ms: .... Initials: .... Surname: ....

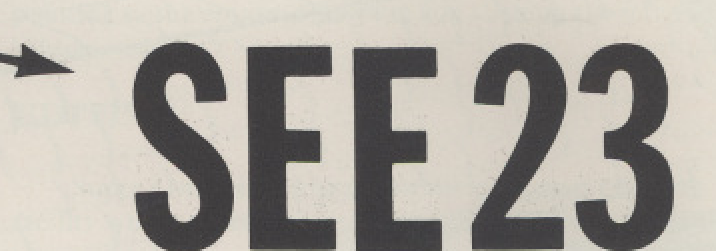
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Do you already own a computer
If so, which one do you own? ....



SEE23

A neat little utility from Gavin Jones that will give you instant information on your keyboard status

SEE23 is basically an extension of the Atari's already powerful E: device. The name means 'Screen Editor Extension version 2.3' and the program will add information to the normal Graphics 0 screen to let you know the status of various keys and in addition will allow you to use a joystick for quick movement of the cursor, including a 'home' facility similar to that found on many other machines.

The status line at the top of the screen will tell you whether the machine is in Caps, Control or lower case, whether the text is in inverse and whether the start/stop flag (CONTROL-1) is on. The joystick will enable the cursor to be moved anywhere and the fire button will return it to the top of the left most column on screen.

GET IT RUNNING

So how do you get it running? Firstly you should type in the BASIC listing using TYPO 3 to check it as you go, and then SAVE this listing to disk. Get a fresh disk with DOS written to it, put it in drive 1, and run the SEE23 listing. This will write an AUTORUN.SYS file to your disk and this disk can then be used to re-boot. You will see the screen change colour and SEE23 will be up and running.

SOME TECHNICAL NOTES

The program reconfigures the system in four ways. Firstly it sets up a new Graphics 0 display list which, instead of having three 112 (8 blank scan lines) instructions at the top of the screen, has one 112, one 96 (7 blank scan lines), one 2 (Graphics 0 line) and one 0 (1 blank scan line). Secondly, it sets up a VBI to handle the cursor movement, the detection of upper/lower case etc. and to update the status line. Thirdly the DOSINI pointer is altered so that all RESETs are trapped to re-initialise SEE23. Finally LOMEM is raised to protect the program.

SOLVING A COUPLE OF PROBLEMS

During the VBI the Display List pointers are changed to point to the new display list which is used to create the extra line. I believe that this is the easiest way to do it, certainly much easier than re-writing the E: handler but, obviously, if the user issues a graphics call, e.g. GR. 8, he will only be in this mode until the next VBI – approx 1/50th of a second! To solve this I thought that as location 87 contains the BASIC mode number, all I have to do is check location 87 and if it is equal to 0, change the Display List, otherwise leave it alone. It turns out however that this location is always set to 0 during the VBI (either that or my code is naff!) so it wouldn't work. The solution I came up with was to look at the Display List and see if it contained an Antic mode 2 two lines down the screen. If it did, I would change the screen otherwise I would assume that the screen was not GR. 0 and so leave it alone.

There might of course be a problem with a custom written Display List as, sometimes, the display will get corrupted but this doesn't matter too much as, if you are using a custom Display List, you probably won't want SEE23 running anyway and all you have to do is press OPTION and RESET together, re-run your program and it will work fine.

DOS is a major problem. I had two choices about where to place SEE23. I could have placed it at the top of RAM, and have it trashed by a GR.8 call, or I could put it at the bottom of RAM and get it trashed by DOS! I chose that latter so my code starts at $1F00 and changes the LOMEM pointer to point just after it. If you call DOS however, while the program is running it will crash the machine as DOS overwrites the VBI code but there is, fortunately, a way round this. If you hold down OPTION and press RESET the SEE23 program will turn itself off and you can go to DOS as many times as you like. To get back to SEE23 type X=USR(7936) and press RESET.

SUMMARY

The status line will show the effect of the Caps, Inverse and CNTROL-1 keys. Play around with them to see the effect.

The joystick moves the cursor and the fire button will 'home' the cursor to top left. On the 400/800 machines you will hear an awful buzzing sound from the console speaker and the cursor may disappear sometimes. This is not a program fault, it happens because the K: handler is making a click using STA CONSOL and STA WSYNCs. STA WSYNC waits for a horizontal sync, so if you move the cursor past the line waiting to be drawn, the cursor seems to disappear. On the XL/XE machine the problem is solved by turning off the key click.

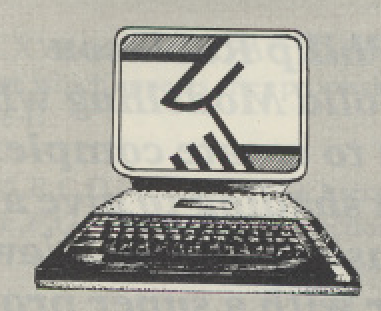
If you get fed up with the new screen colour, pressing START and RESET will return the colours to the normal default.

To go to DOS, turn off SEE23 by pressing OPTION and RESET. If you want to boot up directly to DOS, hold the OPTION key down until after the 'raspberry' sound and this will prevent the program from ever being activated.

```
EI 1 REM ********************************
QQ 2 REM *           SEE23              *
TA 3 REM *                              *
DH 4 REM *       by Gavin Jones         *
EC 5 REM * ---------------------------- *
IZ 6 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EO 7 REM ********************************
NN 8 REM
ZW 10 REM AUTORUN.SYS builder for SEE23
CO 20 REM by Gavin Jones.
BA 30 REM
YN 35 ? "}Insert formatted disc with DOS
   then":? "press [START] to write AUTORU
   N.SYS."
LQ 36 IF PEEK(53279)<>6 THEN 36
TO 40 OPEN #1,8,128,"D:AUTORUN.SYS"
MV 45 ? :? "Creating AUTORUN.SYS file..."
DZ 50 FOR A=1000 TO 1450 STEP 10
RZ 80 RESTORE A
GZ 90 FOR B=1 TO 15:READ C:PUT #1,C:NEXT
   B
CP 100 NEXT A
LU 110 ? :? "File created":CLOSE #1:END
PZ 1000 DATA 255,255,0,31,159,33,173,31,2
   08,201,3,208,1,96,165
PD 1010 DATA 12,141,30,31,165,13,141,31,3
   1,169,29,133,12,169,31
TG 1020 DATA 133,13,76,33,31,32,255,255,2
   16,169,1,133,66,173,36
JC 1030 DATA 2,141,158,33,173,37,2,141,15
   9,33,169,32,141,37,2
OJ 1040 DATA 169,77,141,36,2,169,0,133,66
   ,141,48,2,169,32,141
TX 1050 DATA 49,2,169,35,105,1,141,3,32,1
   69,32,141,4,32,169
GB 1060 DATA 160,141,231,2,169,33,141,232
   ,2,173,31,208,201,3,208
DW 1070 DATA 13,173,30,31,133,12,173,31,3
   1,133,13,76,116,228,173
FB 1080 DATA 31,208,201,6,208,10,169,148,
   141,153,33,169,202,141,154
IX 1090 DATA 33,173,153,33,141,198,2,173,
   154,33,141,197,2,96,10
BT 1100 DATA 0,96,98,180,31,0,66,64,156,2
   ,2,2,2,2,2
CE 1110 DATA 2,2,2,2,2,2,2,2,2,2,2,2,2,2,
   2
OW 1120 DATA 2,2,65,31,144,129,128,128,12
   8,179,165,165,128,182,165
PP 1130 DATA 178,179,169,175,174,128,146,
   142,147,128,128,181,176,176,165
ER 1140 DATA 178,128,163,161,179,165,128,
   128,174,175,178,173,161,172,128
WC 1150 DATA 128,128,141,21,33,140,21,33,
   142,21,33,173,48,2,133
IR 1160 DATA 204,173,49,2,133,205,160,11,
   177,204,201,2,208,10,160
SS 1170 DATA 31,140,49,2,160,0,140,112,96
   ,98,0,6,0,66,64
ZG 1180 DATA 156,2,2,2,2,2,2,2,2,2,2,2,
   2,2
YU 1190 DATA 2,2,2,2,2,2,2,2,2,65,0,32,0,
   0,0
ZH 1200 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,
   0
ZK 1210 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,
   0
DA 1220 DATA 0,0,0,0,0,0,0,0,0,141,155,33
   ,140,156,33
PZ 1230 DATA 142,157,33,173,48,2,133,204,
   173,49,2,133,205,160,11
FO 1240 DATA 177,204,201,2,208,10,160,32,
   140,49,2,160,0,140,48
BD 1250 DATA 2,160,0,173,190,2,201,0,240,
   7,201,64,240,17,76
LU 1260 DATA 158,32,185,125,33,153,92,33,
   200,192,7,208,245,76,169
OZ 1270 DATA 32,185,118,33,153,92,33,200,
   192,7,208,245,76,169,32
YH 1280 DATA 185,132,33,153,92,33,200,192
   ,7,208,245,160,0,173,182
YP 1290 DATA 2,201,0,240,3,76,195,32,185,
   139,33,153,104,33,200
LO 1300 DATA 192,7,208,245,76,206,32,185,
   146,33,153,104,33,200,192
DP 1310 DATA 7,208,245,173,255,2,201,0,24
   0,8,169,171,141,111,33
OI 1320 DATA 76,226,32,169,160,141,111,33
   ,160,0,185,71,33,233,31
VJ 1330 DATA 153,35,32,200,192,42,208,243
   ,169,255,141,219,2,173,0
KD 1340 DATA 211,41,15,201,7,240,20,201,1
   1,240,21,201,13,240,27
WD 1350 DATA 201,14,240,18,169,0,141,219,
   2,76,39,33,169,135,76
SQ 1360 DATA 36,33,169,134,76,36,33,169,1
   42,76,36,33,169,143,141
TM 1370 DATA 252,2,173,132,2,201,0,208,13
   ,165,82,133,85,169,23
GS 1380 DATA 133,84,169,143,141,252,2,173
   ,155,33,172,156,33,174,157
RU 1390 DATA 33,76,98,228,160,160,160,160
   ,211,197,197,160,214,197,210
IE 1400 DATA 211,201,207,206,160,178,174,
   179,160,160,213,208,208,197,210
BS 1410 DATA 160,195,193,211,197,160,160,
   206,207,210,205,193,204,160,160
QE 1420 DATA 160,160,160,160,160,160,213,
   208,208,197,210,160,195,204,207
CG 1430 DATA 215,197,210,160,195,195,206,
   212,210,204,160,195,206,207,210
TR 1440 DATA 205,193,204,160,201,206,214,
   197,210,211,197,6,0,0,0
NE 1450 DATA 0,0,0,224,2,225,2,0,31,0,0,0
   ,0,0,0
```

●

Contact



PEN PALS/CONTACT

ST PENPALS WANTED: To swap hints and tips etc. on a European basis. All letters replied to. Contact David McKeever, Hillhead, Tarbolton, Mauchline, Ayrshire, Scotland, KA5 5NT

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ATARI 850 INTERFACE: In mint condition plus dust cover, communication software and quick connect I/O board. Bargain at £65. Tel. G.Tinsley (0270) 766462

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URGENTLY REQUIRED: Page 6 issues 1-18, also needed ANTIC August 1984. Please phone Dean, 021 472 0073, after 6 p.m.

WANTED: Atari 130XE in good working condition, pay £50. Contact J. Dimmer 0980 22991

TRIPLER BOARD WANTED: From ex-Computer Support or a Ramrod XL (from CDY Consulting (USA)). Also an internal 256K upgrade for 64K 800XL or a cheap external version. Cash or swap for Omnimon XL chip. Harrogate 0423-879533

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DISK DRIVE/PRINTER: Wanted any 8-bit drive or printer. Swap for WASP synthesizer:- twin VCO's; VCF; VCA; White Noise; Only 2 octave keyboard but capable of any note by means of band shifting. 4 waveforms; frequency controls; FULL ADSR control. Valued about £100. Write to: S. O'Hanrahan, 6 Northdown Hill, St. Peters, Broadstairs, Kent. CT10 3JH

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The 3-D ANIMATOR

In Issue 26 Philip Robinson presented Solid Modelling which allowed you to create complex objects with shading to give a three dimensional effect. Now he goes further with a super program that not only allows you to create true 3-D objects but also allows you to animate them at high speed!

Have you ever wanted to sit in front of your computer, sketch a simple outline of an object with a joystick and then watch as your computer turns the outline into a full 3-D image complete with hidden surfaces? The 3-D Animator will do this for you but it will also allow you to view the 3-D image at any orientation and scale with a variety of surface textures *and* it will automatically calculate and record different views of the image and play them back at high speed to produce full 3-D animation!

Sounds interesting? Type in the listings, following the instructions given carefully, and you will then be ready to follow the Tutorial which will teach you how to use The 3-D Animator fully. After that, use your imagination to create and animate some beautiful objects of your own.

The 3-D Animator will only run on 48k disk based systems and uses virtually all of the available memory. In order to leave as much memory as possible available for images, the individual modules are only loaded when required and there is minimal error trapping, so take care, especially when entering filenames. Note that even small changes to the listings may cause the program to crash.

TUTORIAL

The easiest way to learn how to use The 3-D Animator is to follow a tutorial, so boot up your 3-D Animator disk and follow each of these steps which will start with drawing a simple image and end up with a fully animated Image File. Before beginning, take note that your 3-D Animator disk must be left in the drive at all times and must not be write-protected. Note also that error trapping in the program is minimal and it is particularly important to include the drive specifier (D:) in *all* filenames.

1. GENERATING AN IMAGE

Let's begin by creating a simple image. Select Option 1 – Generate an Image from the main menu and the Graphic Editor screen will appear. A joystick plugged into port 1 will control a small single pixel cursor which can be positioned anywhere on the right hand side of the screen. The space bar will toggle between a fast or slow cursor. Try it.

Our first shape will be a square headed nail as shown in Figure 1. This shows the Graphic Editor screen with an outline drawn on it and a view of the 3-D image that will be generated from the outline shown. Position the cursor at point A and press the fire button (a short sharp press to avoid selecting the point twice). Move the cursor to point B, press the fire button to select the point, and then move to points C and D pressing the fire button each time. Now press any key on the keyboard and you will be prompted for the 'Number of sections' required.

This represents the number of 'steps' taken in rotating the outline around the central axis when forming the 3-D image. In this case a square headed nail is required so enter 4 in response to the prompt and press Return. A prompt for the filename will now appear. Enter the drive and a filename in the normal way *but do not specify any extender*. Note you *must* include the drive specifier. For our tutorial use the filename D:NAIL.

Four files will now be created. Using the example given these will be NAIL, NAIL.XYZ, NAIL.FAC and NAIL.CTL. You will see messages as each section is processed and information is stored into two of the files (NAIL.XYZ and NAIL.FAC). When all the sections have been processed a message will appear showing the number of coordinates required to represent the 3-D image. The number of coordinates is calculated as follows:

$$(\text{Number of points}) \times (\text{numbers of sections} + 1)$$

The 3-D Animator can only display images with up to 98 coordinates due to memory limitations so you must not exceed this limit or the display function will crash! With our square headed nail, the number of coordinates message should be 20 – $(4 \text{ points}) \times (4+1 \text{ sections}) = 20$.

Following this message will be a prompt asking if more outlines are to be added to the image. Enter Y and then add points E, F, G from Figure 1 in that order. Next press any key on the keyboard and the prompt for 'Number of sections' will appear again. This time we require a more rounded shape for the shaft of the nail so enter 6.

Each section will now be processed and messages will be displayed as further information is stored into the two files

NAIL.XYZ and NAIL.FAC. The number of coordinates message which appears after processing is complete should now be 41:

A,B,C,D (4 points) × (4+1 sections) = 20
E,F,G (3 points) × (6+1 sections) = 21
Total = 41

Now enter N to the prompt asking if more outlines are to be added to the image and a message 'Completing image file' will appear. Information will be stored in the NAIL.CTL file and you will be returned to the main menu.

At this stage details of the 3-D image are stored in the three files NAIL.XYZ, NAIL.FAC and NAIL.CTL. These three files are collectively called the Image File. The fourth file (NAIL) is empty, ready to be used for storage of views of the 3-D image.

TWO SIMPLE RULES: When drawing outlines you must conform to two simple rules:

1. Outlines must be drawn in a clockwise direction. In the NAIL example you did that by drawing the points in the order A,B,C,D for the first outline and E,F,G for the second outline.
2. Outlines must be 'closed'. They can be closed either by the central axis being part of the outline or, if drawn away from the central axis, by closing the outline itself (i.e. a square, triangle etc.) The outlines for the NAIL are closed by the central axis along the lines AD and DG.

2. DISPLAYING/FILING VIEWS OF AN IMAGE

Now you have drawn an image in outline which has automatically been saved to disk, it is time to have a look at what the 3-D image looks like. Select Option 2 – Display/File Views of an Image from the main menu. A prompt will appear asking for the name of an Image File. This can be any image that you have created and which is on your 3-D Animator disk. Remember to enter the drive specifier followed by the filename of your image but *do not specify an extender..* In this tutorial example you enter D:NAIL. The image will be read from the NAIL.XYZ, NAIL.FAC and NAIL.CTL files into memory and the screen will blank.

The following control keys are now active.

D – Display/File views of an image
V – Viewing specifications for an image
I – Initialise (to null) settings for rotation, scaling and transformation of image
R – Specify rotation of image
S – Specify scaling of image
T – Specify transformation of image
E – End (Return to main menu)

The first thing to do is see what our image looks like so press the D key and you will see a prompt for the 'number of displays' required. For the time being we only want to see the image on screen so enter 1 and you will then be asked if you want 'filing'. Enter N and press Return. If you enter Y the resulting image will be saved to disk and will overwrite any existing image.

The 3-D Animator will now start generating the display. There are many calculations involved so the screen is 'turned off' allowing more CPU power to be devoted to the calculations. So that you will know that the computer is still working, it will 'beep' once after each of the three major sets of calculations it performs and after the third 'beep' the display will be turned on and the image will be drawn. A fourth 'beep' will indicate when the image is complete.

Selecting a Different View

You should now have a front view of your nail but this doesn't show the 3-D nature of the image very well so we will rotate it into a better viewing position. Press the I key which will initialise all the rotation, scale and transformation settings to null. A message will be briefly displayed indicating that the settings are initialised. Press the R key and you will be prompted to enter the rotation (in degrees) that you require for each axis. Positive values will rotate the image in the directions shown in Figure 2, negative values in the reverse directions. Enter 45,0,45 to rotate the image around both the X and Z axes and wait for the prompt to disappear.

Each time you change the image you must redraw by pressing the D key. You will know when the image is ready because any on screen prompt will disappear, so wait and then press D. Request 1 display and no filing and after the calculations (blank screen, three 'beeps'), the image will be drawn. If you watch the image you will notice how it is built by drawing the most distant parts first with the nearer parts being overlaid on top. This is the so-called 'Painters

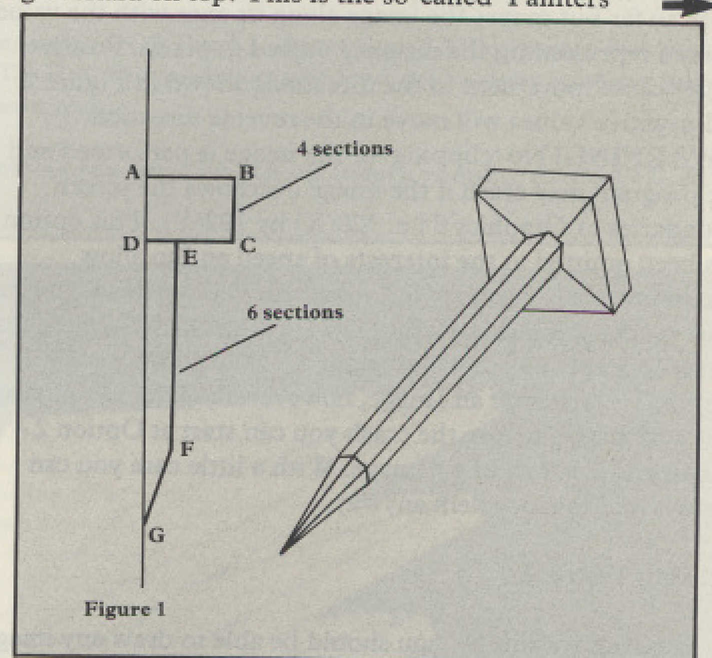


Figure 1

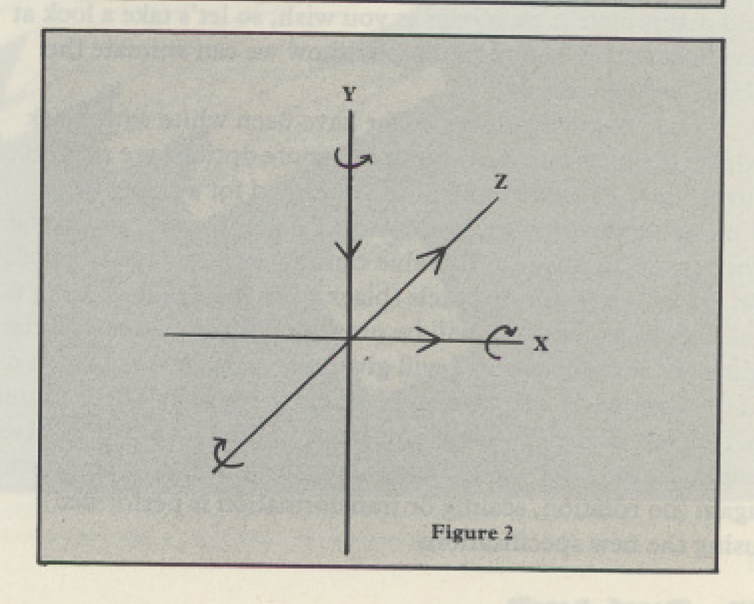


Figure 2

Algorithm' and provides the correct display of the image with regard to 'hidden surfaces'. You now have the image of the nail viewed from a different angle.

Scaling and Moving the Image

Supposing you want to enlarge or reduce the image? No problem, just press the S key and you will be prompted to enter the scaling factor that you require for each axis. You may scale each of the three axes independently allowing you to make, for instance a 'fatter' or 'longer' image. Enter 0.6,0.6,0.6 to reduce the size of each axis to 6 tenths of its original size and wait for the prompt to disappear. Press the D key, request 1 display and no filing and the reduced image will be drawn. You will see that the image has reduced in size but it has also rotated. Why?

An important point to remember regarding rotation, scaling and transformation is that each change is 'added' to any previous change unless the settings are initialised first. If only scaling had been required, the I key should have been pressed prior to setting the scaling factors.

Now, let's put the image back to its original size. Press the I key followed by the S key and enter 1.67,1.67,1.67 to scale the image up to its original size. Press the D key, request 1 display and no filing and as the image is drawn you will notice that it doesn't rotate this time.

So far we have changed the viewing angle of the image and reduced and enlarged it, but suppose we want it move to another part of the screen? This is where 'transformation' comes in. The T key works in a similar way to the examples given so far but moves the image along its axes with the values entered representing the distance moved in pixels. Positive values cause movement in the directions shown in Figure 2 and negative values will move in the reverse direction.

A WARNING! No 'clipping' of the image is performed and the program may crash if the image overflows the screen boundaries of Graphics 8 i.e. 320(X) by 192(Y). This option has been omitted in the interests of speed and to allow maximum use of memory for images. If you do crash, you may start again by entering RUN "D:MENU.3D". When the main menu appears you must start right at the beginning with Option 1 – Generate an Image, however if you hadn't filed any views of images before the crash you can start at Option 2 – Display/File Views of an Image. With a little care you can easily avoid this problem anyway.

Adding Texture

Having got this far you should be able to draw any image and manipulate it on screen as you wish, so let's take a look at one final option before finding out how we can animate the object we have created.

The images displayed so far have been white with black edges (the initial default) but many more options are available. Press the V key and you will be prompted for a shade value. This value determines the density of pixels that are set on the surfaces of an image. The value can range from 0 for all pixels on (white) to 64 for no pixels (black). Enter a shade value of 60 (almost black) and you will be prompted for the texture of the surfaces. A response of Y will give a regular effect known as a Half-Tone and a response of N will give Random effect. Enter Y for Half-Tone. You will now be prompted for white or black edges. Enter Y for white edges. The image will now be drawn again (no rotation, scaling or transformation is performed) using the new specifications.

Try some of your own settings to see the effects. For a 'wire-frame' image enter 64 for Shade, Y for Half-Tone and Y for White Edges. To return to the default settings enter 0 for Shade, Y for Half-Tone and N for White Edges.

3. MAKE IT MOVE!

You should now be able to display an image at any orientation, scale and texture so now comes the big moment! Let's produce a moving image.

Firstly you should position the image using the features you have learned so far, so that it looks roughly as in Figure 1. You should have white surfaces and black edges. If you can't manage to get back to that view, don't worry, it is not that important so long as you have a good view of the image otherwise the animation could be disappointing.

Animation consists of rotating the image through a number of steps. Press the I key to initialise all rotation, scaling and transformation and then press the R key. Enter 0,90,0 to rotate the image around the Y axis and then press the D key and request 5 displays *with* filing.

The next process will be automatic and in this example will take around five minutes. Five displays will be generated and filed on disk (in the NAIL file) and after filing each display, a message will briefly appear showing the total amount of data written to disk so far and the number of displays still remaining to be generated and filed. Keep an eye on the amount of data written for each image as it will show you how many displays you can have in the Image File if you should want to change it later.

When all displays have been filed the image will remain on screen but the 'Filing – Please wait' message will disappear. The process is virtually complete so press the E key and after a little more file activity you will be returned to the main menu. You can now use Option 3 to view your animated sequence. Simply enter D:NAIL when prompted for a filename.

That's just about it, except for one final option when you are viewing an animated sequence. Pressing any key apart from F will abort the image and return you to the menu but the F key allows you to select the speed of the animation. The speed is initially set to the maximum of 256 (approximately 1 tenth of a second) which is the slowest animation. Try a delay of 100, or less, for some really fast moving shapes!

TWO SIMPLE RULES FOR ANIMATION: When producing animated sequences you must conform to these two simple rules.

1. The first and last display in the animated sequence must be the same. In the NAIL example you did that by rotating the image through 90 degrees five times – think about it!
2. The animated sequence file must not contain more than 22,000 characters of data due to memory limitations, which is why it is important to note the amount of data written for each image. When producing an animation, it is wise to generate and file a few displays to start with so that you can judge the likely size of the final file by watching the data written messages. Obviously simple shapes can be animated through more stages than more complex ones.

There you have it! You should be able to create some superb objects and animate them as you wish. Use your imagination to combine as many of the features as you can and have fun! I hope that you have as much enjoyment using The 3-D Animator as I did in developing it!

```
EI 1 REM ********************************
SB 2 REM *     3-D SOLID ANIMATION      *
OI 3 REM *          LISTING 1           *
EB 4 REM * ---------------------------- *
IY 5 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EN 6 REM ********************************
ZP 9 REM ____ LOADER ROUTINE FROM ____
              ANALOG MAGAZINE
EL 10 TRAP 20:? CHR$(125):POKE 710,0:? :?
   "3-D SOLID ANIMATION ASSEMBLY LOADER"
EG 15 DATA 0,1,2,3,4,5,6,7,8,9,0,0,0,0,0,
   0,0,10,11,12,13,14,15
OK 20 DIM DAT$(91),HEX(22):FOR X=0 TO 22:
   READ N:HEX(X)=N:NEXT X:LINE=990:RESTOR
   E 1000:TRAP 70:? :? " CHECKING DATA"
QO 25 TOTAL=0:LINE=LINE+10:? "LINE:";LINE
   :READ DAT$:IF LEN(DAT$)<>90 THEN 180
QE 28 DATLIN=PEEK(183)+PEEK(184)*256:IF D
   ATLIN<>LINE THEN 80
LU 30 FOR X=1 TO 89 STEP 2:D1=ASC(DAT$(X,
   X))-48:D2=ASC(DAT$(X+1,X+1))-48:BYTE=H
   EX(D1)*16+HEX(D2)
JN 40 IF PASS=2 THEN PUT #1,BYTE:NEXT X:R
   EAD CHKSUM:GOTO 25
HC 50 TOTAL=TOTAL+BYTE:NEXT X:READ CHKSUM
   :IF TOTAL=CHKSUM THEN 25
OK 60 GOTO 180
WF 70 IF PEEK(195)<>6 THEN 180
BE 75 IF ASS=0 THEN 120
QT 77 ? "ALL DONE":END
DM 80 IF ASS=2 AND LINE=1100 THEN 120
FW 83 IF ASS=3 AND LINE=2200 THEN 120
VW 86 IF LINE=1100 THEN LINE=1990:RESTORE
    2000:GOTO 25
ZM 87 IF LINE=2200 THEN LINE=2990:RESTORE
    3000:GOTO 25
AC 90 ? "LINE ";LINE;" MISSING!":CLOSE #1
   :END
LB 120 CLOSE #1
AE 130 IF ASS=0 THEN OPEN #1,8,0,"D:OBJ1.
   3D":PASS=2:ASS=2:LINE=990:RESTORE 1000
   :TRAP 70:GOTO 160
QY 140 IF ASS=2 THEN OPEN #1,8,0,"D:OBJ2.
   3D":ASS=3:LINE=1990:RESTORE 2000:TRAP
   70:GOTO 160
EB 150 IF ASS=3 THEN OPEN #1,8,0,"D:OBJ3.
   3D":PASS=2:LINE=2990:RESTORE 3000:TRAP
    70:GOTO 160
BC 160 ? :? "WRITING FILE":GOTO 25
MU 180 ? "BAD DATA: LINE ";LINE:? TOTAL:L
   IST LINE
ZR 1000 DATA FFFF2E1DD01EFF550000A5CC1007
   38A900E5CC85CC85CDA900A20046CD90031865
   CC6A66CECAD0F385CF60A900,5658
QO 1010 DATA 8DFC1C8DFD1CA2102E001D2E011D
   2EFC1C2EFD1C38ADFC1CEDFE1CA8ADFD1CEDFF
   1C90068CFC1C8DFD1CCAD0DB,5616
YK 1020 DATA 2E001D2E011D0EFC1C2EFD1CB00F
   38ADFE1CEDFC1CADFF1CEDFD1CB008EE001DD0
   03EE011D60A208A9008D021D,4502
GW 1030 DATA 8D031D85D085D10E021D2E031DEE
   021DD003EE031D06CC26CD26D026D106CC26CD
   26D026D138A5D0ED021DA8A5,4651
ES 1040 DATA D1ED031D901285D184D0EE021DD0
   03EE031DCAD0C54C051E38AD021DE9018D021D
   B003CE031DCAD0B16E031D6E,4712
AI 1050 DATA 021D60AD2E1D8D301D4D2F1D2E31
   1D6A6E311D8D2E1DAD301D8D2F1D60AD051D85
   55AD061D8556AD071D855460,3317
IS 1060 DATA 20261EA9014C431E20261EA9028D
   041DA260A90B9D4203A9009D48039D4903AD04
   1D2056E460AD051D29078D08,3241
OT 1070 DATA 1DAD071D29070A0A0A0D081DAABD
   991ECD081D10034C3E1E4C361E200C1E4A4ACD
   081D10034C3E1E4C361EAD0A,2494
EC 1080 DATA 1DF0034C5C1E4C7E1E0000353D02
   0A373F1018252D121A272F3139040C333B060E
```

TYPING IT IN

The program is split into seven listings and all of these must be on the same disk. Any image files created must also be on this disk so it is recommended that you start with a newly formatted disk before typing in the listings. Now follow these instructions carefully.

1. Type in each of the listings separately, checking them with TYPO 3 as you go, and SAVE each to disk. Note that you should type NEW after each listing has been SAVEd. The listings MUST be saved with the following filenames.

Listing 1 should be D:LOADER.3D
Listing 2 should be D:ANIMATE.3D
Listing 3 should be D:ASM.3D
Listing 4 should be D:MENU.3D
Listing 5 should be D:GEN.3D
Listing 6 should be D:DSP.3D
Listing 7 should be D:PRJ.3D

If you don't use the above filenames the program will not work.

2. With the disk containing the above files in drive 1, type RUN "D:LOADER.3D". This will create three additional files on the disk, OBJ1.3D, OBJ2.3D and OBJ3.3D.

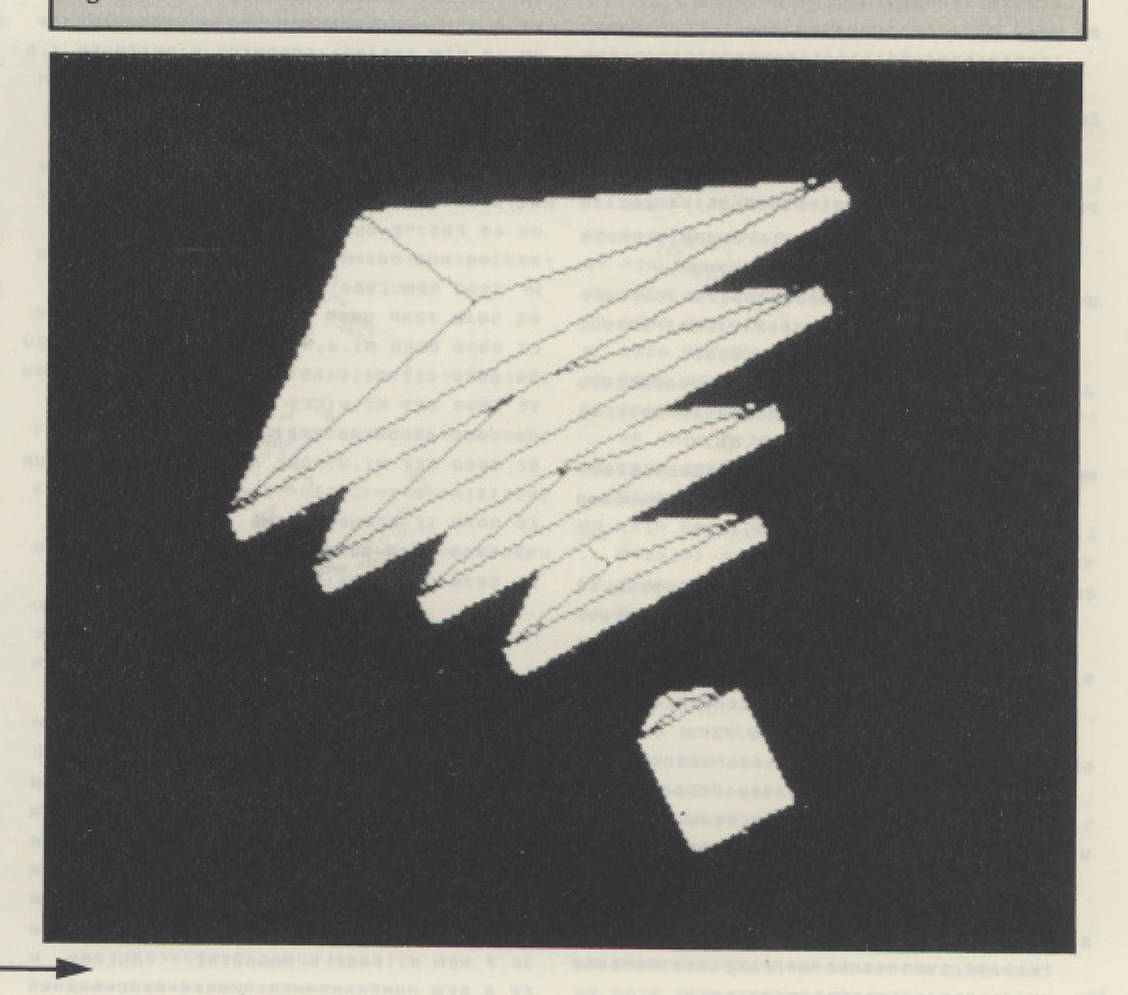
3. The file LOADER.3D is no longer required and can, optionally, be deleted from your disk (make sure you have a copy on another disk, just in case!)

4. Note that the main disk MUST be used for storing all Image Files created with the program so it is recommended at this stage that you make a working copy using the DOS duplicate disk function. Write protect your original and file it away and use the working copy which should not be write protected.

RUNNING THE PROGRAM

1. Boot up the computer using DOS 2 or 2.5, insert your 3-D Animator disk and type RUN "D:ANIMATE.3D". The program will load the various routines and present you with the main menu.

2. If you have any problems you *must* switch off before running ANIMATE.3D again.



```
   2129141C232B161E030B363E,1840
CD 1090 DATA 0109343C131B262E1119242C323A
   070F3038050D222A171F2028151D0000000000
   0000000000000000000000000,878
YT 1100 REM * 450 BYTES
VC 2000 DATA FFFFD91E3C22A002B90D1D48B910
   1D990D1D6899101D8810EF60A002B9101D48B9
   131D99101D6899131D8810EF,4117
PF 2010 DATA 60A20238AD101DED0D1DAD111DED
   0E1DB00320D91ECAF01538AD131DED101DAD14
   1DED111DB0DC20ED1E4C031F,4102
VY 2020 DATA 6068A9028D141D20011F20C120AD
   0D1D8D051DAD0E1D8D061DAD0F1D8D071DAD1A
   1DD07D38AD191DED1E1DB074,3490
OX 2030 DATA AD1E1D8D281D8D2B1D4E281D38AD
   191DED281D8D281DAD1A1DE9008D291DEE2B1D
   AD2A1DD00620361E4C891F20,3433
DC 2040 DATA 3E1EAD231DD005EE071DD003CE07
   1D2C291D301AEE051DD003EE061D38AD281DED
   1E1D8D281DAD291DE9008D29,3675
JR 2050 DATA 1D18AD281D6D191D8D281DAD291D
   6D1A1D8D291DCE2B1DD0AE60AD191D8D281D8D
   2B1DAD1A1D8D291D8D2C1D4E,3423
QS 2060 DATA 291D6E281D38AD1E1DED281D8D28
   1DA900ED291D8D291DAD2A1DD00620361E4C06
   20203E1EEE051DD003EE061D,3308
BY 2070 DATA 2C291D3020AD231DD005EE071DD0
   03CE071D38AD281DED191D8D281DAD291DED1A
   1D8D291D18AD281D6D1E1D8D,3491
OC 2080 DATA 281DAD291D69008D291D38AD2B1D
   E9018D2B1DB003CE2C1D2C2C1D10A06038AD16
   1DED171DB00EAD161D48AD17,3474
MI 2090 DATA 1D8D161D688D171DAD161D8D071D
   208E1EAD161DCD171DF006CE161D4C702060AD
   221D85CCAD211D85CD203F1D,3693
WH 2100 DATA 8D011DA5CE8D001DA9008DFF1CAD
   1D1D8DFE1C20531DAD261DD00918AD181D6D00
   1D900738AD181DED001D6038,3799
ZY 2110 DATA AD101DED0D1D8D191DAD111DED0E
   1D8D1A1D38AD131DED101D8D1B1D38AD131DED
   0D1D8D1C1DA9008D231D8D24,3448
JJ 2120 DATA 1D8D251D38AD121DED0F1DB009EE
   231DAD0F1DED121D8D1E1D38AD151DED121DB0
   09EE241DAD121DED151D8D1F,3711
ME 2130 DATA 1D38AD151DED0F1DB009EE251DAD
   0F1DED151D8D201D606820011FAD2D1DD0034C
   222220C120AD0D1D8D051DAD,3470
DC 2140 DATA 0E1D8D061D38AD051DED0D1D8D22
   1DAD191DF0538D1D1DAD1E1D8D211DAD231D8D
   261DAD0F1D8D181D2088208D,3346
IU 2150 DATA 161DAD1C1DF0338D1D1DAD201D8D
   211DAD251D8D261D2088208D171D205920AD06
   1DCD111DD008AD051DCD101D,3333
PD 2160 DATA F00BEE051DD003EE061D4C4E2138
   AD051DED0D1D8D221DAD1C1DF0638D1D1DAD20
   1D8D211DAD251D8D261DAD0F,3780
OY 2170 DATA 1D8D181D2088208D171D38AD051D
   ED101D8D221DAD1B1DF0398D1D1DAD1F1D8D21
   1DAD241D8D261DAD121D8D18,3357
JJ 2180 DATA 1D2088208D161D205920AD061DCD
   141DD008AD051DCD131DF00BEE051DD003EE06
   1D4CB021AD271DF01520371F,3624
WH 2190 DATA 20ED1E20371F20D91E20ED1E20D9
   1E20371F6000000000000000000000000000000
   0000000000000000000000000,1488
YR 2200 REM * 900 BYTES
ZH 3000 DATA FFFF3D222423686885CD6885CC68
   85CF6885CE6868AAA000B1CC91CE88D0F9E6CD
   E6CFCAD0F260686885CD6885,6816
RI 3010 DATA CC6885CF6885CEA000B1CCD1CED0
   0AC8D0F7E6CDE6CF1890F084CEA5CC1865CE85
   CC9002E6CDA5CC85D4A5CD85,7373
GF 3020 DATA D560686885D16885D0A5D185CDA5
   D085CCA9FFA001D1CCD02488D1CCD002F0E9A2
   00A00088D0FDCAD0F8A5CC18,7170
R5 3030 DATA 690285CC9002E6CDA9FFCDFC02F0
   D560A000B1CC85CEC8B1CC85CFA5CC18690285
   CC9002E6CDA000B1CCA8B1CC,6766
BJ 3040 DATA 91CE88D0F9A5CC1871CC85CC9002
   E6CDA5CC186901 85CC909EE6CD189099686880
   5503688D5403A9FF8D58038D,6032
K5 3050 DATA 5903A9078D5203A2102056E46000
   000000000000000000000000000000000000000
   0000000000000000000000000,1114
ZN 3060 REM * 270 BYTES
```

```
EI 1 REM ********************************
SH 2 REM *       THE 3-D ANIMATOR       *
RN 3 REM *     by Philip Robinson       *
EO 4 REM *     ------------------       *
RJ 5 REM *          LISTING 2           *
ED 6 REM * ---------------------------- *
JA 7 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EP 8 REM ********************************
LR 10 PGMSIZ=24:DIM SUBR$(PGMSIZ)
IN 20 FOR I=1 TO PGMSIZ
UW 30 READ BYTE
JZ 40 SUBR$(I)=CHR$(BYTE)
IT 50 NEXT I
YC 60 PROTECT=1600
CX 70 HI=INT(PROTECT/256):LOW=PROTECT-256
   *HI
RL 80 SUBR$(6,6)=CHR$(LOW)
CS 90 SUBR$(14,14)=CHR$(HI)
RL 95 ? "KRUN";CHR$(34);"D:ASM.3D";CHR$(3
   4);"{X}";:POKE 764,12
GD 100 Z=USR(ADR(SUBR$))
NU 110 DATA 24,173,231,2,105,0,141,231,2,
   173,232,2,105,0,141,232,2,169,0,133,8,
   76,0,160
```

```
EI 1 REM ********************************
SH 2 REM *       THE 3-D ANIMATOR       *
RN 3 REM *     by Philip Robinson       *
EO 4 REM *     ------------------       *
SI 5 REM *          LISTING 3           *
ED 6 REM * ---------------------------- *
JA 7 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EP 8 REM ********************************
QR 10 DIM FN$(20):GRAPHICS 0:SETCOLOR 2,0
   ,0:SETCOLOR 1,0,15
UF 20 PRINT "LOADING ASSEMBLER CODE"
LM 30 PRINT "PLEASE WAIT"
NK 40 FN$="D:OBJ1.3D":GOSUB 5000
NZ 50 FN$="D:OBJ2.3D":GOSUB 5000
OO 60 FN$="D:OBJ3.3D":GOSUB 5000
XK 100 RUN "D:MENU.3D"
WF 5000 REM LOAD OBJ FILES
RI 5010 TRAP 5090
LI 5020 OPEN #1,4,0,FN$:GET #1,V:GET #1,V
GB 5030 GET #1,V:GET #1,W:ADSTART=256*W+V
YE 5040 GET #1,V:GET #1,W:ADEND=256*W+V
HA 5050 ADCUR=ADSTART
OZ 5060 GET #1,V:POKE ADCUR,V:ADCUR=ADCUR
   +1
ZC 5070 IF ADCUR<=ADEND THEN 5060
QV 5080 GOTO 5030
EG 5090 CLOSE #1:RETURN
```

```
EI 1 REM ********************************
SH 2 REM *       THE 3-D ANIMATOR       *
RN 3 REM *     by Philip Robinson       *
EO 4 REM *     ------------------       *
TH 5 REM *          LISTING 4           *
ED 6 REM * ---------------------------- *
JA 7 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EP 8 REM ********************************
II 10 GRAPHICS 0:SETCOLOR 2,0,0:SETCOLOR
   1,0,15
AK 20 POSITION 13,1
LS 30 PRINT "3-D ANIMATION"
EK 40 POSITION 18,3
MP 50 PRINT "BY"
CM 60 POSITION 12,5
VA 70 PRINT "PHILIP ROBINSON"
AS 80 POSITION 2,9
AW 90 PRINT "1. GENERATE AN IMAGE":PRINT
BY 100 PRINT "2. DISPLAY/FILE VIEWS OF AN
    IMAGE":PRINT
MD 120 PRINT "3. PROJECT ANIMATED SEQUENC
   E":PRINT
HJ 130 PRINT "4. EXIT":PRINT :PRINT
RV 140 PRINT "ENTER SELECTION";:INPUT N
UL 150 IF N<1 OR N>4 THEN 300
HX 155 PRINT :PRINT "LOADING PROGRAM ---
   PLEASE WAIT"
BM 160 IF N=1 THEN RUN "D:GEN.3D"
OQ 170 IF N=2 THEN RUN "D:DSP.3D"
TF 180 IF N=3 THEN RUN "D:PRJ.3D"
NQ 190 IF N=4 THEN GRAPHICS 0:END
FJ 300 SOUND 1,50,6,8:FOR I=1 TO 150:NEXT
    I
NF 310 SOUND 1,0,0,0:GOTO 10
```

```
EI 1 REM ********************************
SH 2 REM *       THE 3-D ANIMATOR       *
RN 3 REM *     by Philip Robinson       *
EO 4 REM *     ------------------       *
UG 5 REM *          LISTING 5           *
ED 6 REM * ---------------------------- *
JA 7 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EP 8 REM ********************************
B5 10 DIM X(200),Y(200),Z(200),XD(100),YD
   (100)
CY 20 DIM F(4)
GB 30 DIM FN1$(20),FN2$(20),FN3$(20),FN$(
   20)
OO 40 DIM Q$(25),A$(1)
HE 99 GOTO 11000
NU 100 REM DRAW RTN FOR JOYSTICK
SK 110 NUMV=0:INC=8:AORX=160:AORY=96
SU 120 CX=AORX:CY=AORY
JT 125 COLOR 1:PLOT CX,0:DRAWTO CX,191:PL
   OT CX-8,CY:DRAWTO CX+8,CY
XN 130 IF PEEK(764)<>255 THEN 280
XM 140 IF STRIG(0)=0 THEN 250
JI 150 I=STICK(0):IF I=15 THEN 130
EC 160 COLOR 2:PLOT CX,CY
DW 170 IF NUMV<>0 THEN DRAWTO XD(NUMV),YD
   (NUMV)
TZ 180 IF I=7 THEN IF CX+INC<=319 THEN CX
   =CX+INC:GOTO 220
KV 190 IF I=11 THEN IF CX-INC>=AORX THEN
   CX=CX-INC:GOTO 220
NZ 200 IF I=14 THEN IF CY-INC>=0 THEN CY=
   CY-INC:GOTO 220
K5 210 IF I=13 THEN IF CY+INC<=191 THEN C
   Y=CY+INC
DK 220 COLOR 1:PLOT CX,CY
DP 230 IF NUMV<>0 THEN DRAWTO XD(NUMV),YD
   (NUMV)
MW 240 GOTO 130
RU 250 GOSUB 5140:NUMV=NUMV+1
XQ 260 XD(NUMV)=CX:YD(NUMV)=CY
NC 270 GOTO 130
FU 280 IF PEEK(764)<>33 THEN 310
RQ 290 GOSUB 5140:POKE 764,255:INC=INC+7:
   IF INC>8 THEN INC=1
MP 300 GOTO 130
QU 310 GOSUB 5140:POKE 764,255
PB 320 FOR I=1 TO NUMV:XD(I)=XD(I)-AORX
HA 330 YD(I)=YD(I)-AORY:NEXT I
EJ 340 NUMV=NUMV-1
```

```
LX 4000 REM FILE THE IMAGE
YZ 4010 GOSUB 5010
FD 4040 PRINT "ENTER NUMBER OF SECTIONS "
   ;:INPUT NUMH
RO 4050 IF NOF=0 THEN GOSUB 10000
FW 4080 THETA=PHI:GOSUB 6500
ZS 4090 NOF=NOF+(NUMV*NUMH):NOV=NOV+(NUMV
   +1)*(NUMH+1)
AE 4095 GOSUB 5010:PRINT "COORDINATES = "
   ;NOV
UH 4100 Q$="ADD MORE TO IMAGE(Y/N)":GOSUB
    5100
JN 4110 IF A$="Y" THEN GOSUB 5030:GOTO 10
   0
VI 4120 PRINT "COMPLETING IMAGE FILE":GOS
   UB 10100
QX 4130 RUN "D:MENU.3D"
EP 5000 REM GRAPHIC SETTINGS
GE 5010 REM SETUP TEST WINDOW
JP 5020 GRAPHICS 40:GOSUB 5070:? :? :? :?
   :RETURN
BK 5030 REM REMOVE TEXT WINDOW
VG 5040 GRAPHICS 56:GOSUB 5070:RETURN
CS 5050 REM CLEAR SCREEN
SN 5060 GRAPHICS 24:GOSUB 5070:RETURN
NN 5070 REM SET COLOUR REGS.
YV 5080 SETCOLOR 2,0,0:SETCOLOR 1,0,15:CO
   LOR 1
BE 5090 RETURN
IO 5100 REM ASK QUESTION
WF 5110 PRINT Q$;:INPUT A$
ZC 5120 IF A$<>"Y" AND A$<>"N" THEN GOSUB
    5160:GOTO 5110
AO 5130 RETURN
VA 5140 REM BEEP OK
FW 5150 SOUND 1,30,10,8:FOR SND=1 TO 50:N
   EXT SND:GOTO 5180
GA 5160 REM BEEP ERROR
ZU 5170 SOUND 1,50,6,8:FOR SND=1 TO 150:N
   EXT SND
YQ 5180 SOUND 1,0,0,0:RETURN
AS 6500 REM REVBOD
DM 6510 K=PI*2/NUMH
VJ 6520 L=NUMV+1:CT=COS(THETA):ST=SIN(THE
   TA)
YZ 6530 REM FIRST VERTICAL SET
QV 6540 FOR P=1 TO L
EW 6550 X(P)=XD(P)*CT:Y(P)=YD(P):Z(P)=XD(
   P)*ST
SQ 6560 PRINT #1;X(P);",";Y(P);",";
BO 6570 PRINT #1;Z(P)
JB 6580 NEXT P
MT 6590 REM SECOND VERTICAL SET
GQ 6600 FOR Q=1 TO NUMH
SO 6605 GOSUB 5010:PRINT "PROCESSING SECT
   ION ";Q;" OF ";NUMH
OW 6610 THETA=THETA+K:CT=COS(THETA):ST=SI
   N(THETA)
QR 6620 FOR P=1 TO L
LK 6630 X(P+L)=XD(P)*CT:Y(P+L)=YD(P):Z(P+
   L)=XD(P)*ST
GB 6640 PRINT #1;X(P+L);",";Y(P+L);",";
LW 6650 PRINT #1;Z(P+L)
IX 6660 NEXT P
GH 6670 REM FACET (F1,F2,F3..(F4)) SETUP
   ANTI-CLOCKWISE
RY 6680 FOR P=1 TO NUMV
SV 6690 F(W1)=P:F(W2)=P+1:F(W3)=F(W2)+L:F
   (W4)=F(W3)-1
FG 6700 SIZE=4
ML 6710 IF XD(F(W1))=0 THEN SIZE=3
CL 6720 IF XD(F(W2))=0 THEN SIZE=3:F(W3)=
   F(W4)
RY 6730 PRINT #2;SIZE
HU 6740 FOR M=1 TO SIZE
RT 6750 PRINT #2;F(M)+(Q-1)*L+NOV
HS 6760 NEXT M
JI 6790 NEXT P
HA 6830 REM MAKE FIRST SET SECOND SET AND
    REPEAT
RB 6840 FOR P=1 TO L
TV 6850 X(P)=X(P+L):Y(P)=Y(P+L):Z(P)=Z(P+
   L)
FL 6860 NEXT P:NEXT Q
BP 6870 RETURN
FZ 10000 REM GET FILE NAMES
JW 10010 PRINT "ENTER FILENAME ";:INPUT F
   N1$
VN 10020 FN2$=FN1$:FN3$=FN1$:I=LEN(FN1$)+
   1:FN$=FN1$
ZB 10030 FN1$(I)=".XYZ":FN2$(I)=".FAC":FN
   3$(I)=".CTL"
IA 10040 REM OPEN OUTPUT FILES
UO 10050 OPEN #1,8,0,FN1$:OPEN #2,8,0,FN2
   $
IC 10060 OPEN #3,8,0,FN$:CLOSE #3:RETURN
QT 10100 REM CLOSE OUTPUT FILES,WRITE .CT
   L
SL 10110 CLOSE #1:CLOSE #2
XG 10120 OPEN #1,8,0,FN3$
BV 10130 PRINT #1;NOF;",";NOV
QK 10140 CLOSE #1
DU 10150 RETURN
OE 11000 REM INITIALISE
VR 11010 W1=1:W2=2:W3=3:W4=4
FF 11050 PHI=0:PI=3.142:NOF=0:NOV=0
KD 11060 GOSUB 5050
SN 11990 GOTO 100
```

```
EI 1 REM ********************************
SH 2 REM *      THE 3-D ANIMATOR        *
RN 3 REM *    by Philip Robinson        *
EO 4 REM *    ------------------        *
VF 5 REM *          LISTING 6           *
ED 6 REM * ---------------------------- *
JA 7 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EP 8 REM ********************************
KF 10 GOTO 8000
JK 20 OPEN #1,9,0,FN$:P=TV:Q=P+7680:D=DIS
   P
JW 30 P=USR(FIND,P,P-D)
QZ 40 IF P=Q THEN 85
MA 50 S=P:R=P+255:IF R>Q THEN R=Q
IE 60 P=P+1:IF PEEK(P)<>PEEK(P-D) AND P<R
    THEN 60
HD 70 V1=INT((S-1)/256):PUT #1,S-1-V1*256
   :PUT #1,V1:PUT #1,P-S:FOR V1=S TO P-1:
   PUT #1,PEEK(V1):NEXT V1
KH 80 DAT=DAT+P-S+3:GOTO 30
YZ 85 DAT=DAT+2:PRINT "DATA = ";DAT+2;" D
   ISPLAYS = ";ND-1
QZ 90 PUT #1,0:PUT #1,255:CLOSE #1:K=USR(
   MOVE,TV,ADR(SCR$),30):RETURN
BI 91 REM
UO 92 FOR I=1 TO NOV
BL 93 V1=R(1,1)*X(I)+R(1,2)*Y(I)+R(1,3)*Z
   (I)+R(1,4)
FW 94 V2=R(2,1)*X(I)+R(2,2)*Y(I)+R(2,3)*Z
   (I)+R(2,4)
KH 95 V3=R(3,1)*X(I)+R(3,2)*Y(I)+R(3,3)*Z
   (I)+R(3,4)
AY 96 X(I)=V1:Y(I)=V2:Z(I)=V3:NEXT I:RETU
   RN
OM 100 REM
XK 110 T1=2
RS 120 T=T1:P=T:T1=T1*2:IF T1<NVF THEN 12
   0
MI 130 Q=T:R=0:D=P
UF 140 G=NVF-D-1:S=P+R:IF P=R THEN S=P
PQ 150 T1=S*2
XY 160 FOR K=R TO G STEP T1:H=K+S-1:IF G<
   H THEN H=G
QV 170 FOR I=K TO H:J=I+1
SS 180 IF SAZ(J+D)<SAZ(J) THEN T2=SAZ(J):
   SAZ(J)=SAZ(J+D):SAZ(J+D)=T2:T2=STG(J):
   STG(J)=STG(J+D):STG(J+D)=T2
FZ 190 NEXT I:NEXT K
QY 200 IF Q<>P THEN D=Q-P:Q=Q/2:R=P:GOTO
   140
QG 210 P=INT(P/2):IF P<>0 THEN 130
ZC 220 RETURN
OO 300 REM
GG 310 NVF=0:FOR I=1 TO NOF
JF 320 V1=FACET(1,I):V2=FACET(2,I):V3=FAC
   ET(3,I)
VX 330 DX1=X(V2)-X(V1):DY1=Y(V2)-Y(V1)
AR 340 DX2=X(V3)-X(V2):DY2=Y(V3)-Y(V2)
FM 350 IF DX1*DY2-DX2*DY1<0 THEN 390
AR 360 NVF=NVF+1:STG(NVF)=I:SAZ(NVF)=0
NO 370 FOR J=1 TO FACET(0,I):SAZ(NVF)=SAZ
   (NVF)+Z(FACET(J,I)):NEXT J
KD 380 SAZ(NVF)=SAZ(NVF)/FACET(0,I)
NB 390 NEXT I:RETURN
QQ 500 REM
OS 510 REM
DY 520 IF PEEK(764)=255 THEN 520
OW 530 REM
VC 540 KY=PEEK(764):POKE 764,255
AD 550 REM I
SB 560 IF KY=13 THEN 10000
DK 570 REM R
SW 580 IF KY=40 THEN 11000
DX 590 REM S
UV 600 IF KY=62 THEN 12000
DR 610 REM T
WH 620 IF KY=45 THEN 13000
ER 650 REM V
XI 660 IF KY=16 THEN 15000
YP 670 REM D
AW 680 IF KY=58 THEN 16000
YN 710 REM E
RM 720 IF KY=42 THEN OPEN #1,9,0,FN$:PUT
   #1,255:PUT #1,255:CLOSE #1:RUN "D:MENU
   .3D"
NS 790 GOTO 500
QT 800 REM
SQ 810 FOR I=1 TO NVF:T=STG(I):S=FACET(0,
   T)
BQ 860 V1=1:V2=1:GOSUB 2000
CN 870 V1=2:V2=2:GOSUB 2000
JC 880 V1=3:V2=3:GOSUB 2000:GOSUB 2200
DY 890 IF S<4 THEN 930
BV 900 V1=3:V2=1:GOSUB 2000
CS 910 V1=4:V2=2:GOSUB 2000
IB 920 V1=1:V2=3:GOSUB 2000:GOSUB 2200
BL 930 V1=1:V2=1:GOSUB 2000
GT 940 V1=2:V2=2:GOSUB 2000:GOSUB 2100
BX 950 V1=2:V2=1:GOSUB 2000
HF 960 V1=3:V2=2:GOSUB 2000:GOSUB 2100
TV 970 V1=3:V2=1:GOSUB 2000:IF S<4 THEN 1
   000
HR 980 V1=4:V2=2:GOSUB 2000:GOSUB 2100
CV 990 V1=4:V2=1:GOSUB 2000
JA 1000 V1=1:V2=2:GOSUB 2000:GOSUB 2100
ES 1010 NEXT I
AF 1020 RETURN
HX 2000 REM
SI 2010 P=FACET(V1,T):IF INT(X(P)+AORX)>2
   55 THEN 2030
UP 2020 POKE PK(1,V2)+1,0:POKE PK(1,V2),I
   NT(X(P)+AORX):GOTO 2040
ON 2030 POKE PK(1,V2)+1,1:POKE PK(1,V2),I
   NT(X(P)-256+AORX)
XF 2040 POKE PK(2,V2),INT(Y(P)+AORY)
AP 2050 RETURN
HZ 2100 REM
DU 2110 K=USR(LINE1):RETURN
IB 2200 REM
QV 2210 K=USR(FCT):RETURN
IA 5000 REM
ID 5010 REM
JP 5020 GRAPHICS 40:GOSUB 5070:? :? :? :?
    :RETURN
IJ 5030 REM
VG 5040 GRAPHICS 56:GOSUB 5070:RETURN
CS 5050 REM CLEAR SCREEN
SN 5060 GRAPHICS 24:GOSUB 5070:RETURN
NN 5070 REM SET COLOUR REGS.
```

```
YV 5080 SETCOLOR 2,0,0:SETCOLOR 1,0,15:CO
    LOR 1
BE 5090 RETURN
IC 5100 REM
WF 5110 PRINT Q$;:INPUT A$
ZC 5120 IF A$<>"Y" AND A$<>"N" THEN GOSUB
    5160:GOTO 5110
AO 5130 RETURN
IO 5140 REM
IY 5150 SOUND 1,30,10,8:FOR I=1 TO 50:NEX
   T I:GOTO 5180
IU 5160 REM
UU 5170 SOUND 1,50,6,8:FOR I=1 TO 150:NEX
   T I
YQ 5180 SOUND 1,0,0,0:RETURN
TE 8000 REM INITIALISE
IT 8010 GOSUB 20000:AORX=160:AORY=96:DAT=
   0
OQ 8020 RAM=7420
OV 8030 VALUE=RAM+12:POKE VALUE,0
MM 8040 HTORRN=RAM+14:POKE HTORRN,1
VU 8050 PK(1,1)=RAM+17
XS 8060 PK(2,1)=RAM+19
SA 8070 PK(1,2)=RAM+20
TY 8080 PK(2,2)=RAM+22
UH 8090 PK(1,3)=RAM+23
VS 8100 PK(2,3)=RAM+25
TA 8110 EDGES=RAM+43:POKE EDGES,0
ZO 8120 MODE=RAM+46:POKE MODE,1
UE 8130 NOSHD=RAM+49:POKE NOSHD,1
EJ 8140 LINE1=RAM+562
KA 8150 FCT=RAM+1079
FG 8160 MOVE=RAM+1345
DJ 8170 FIND=RAM+1378
QC 8200 DEG :GOSUB 9300:GOSUB 5050
DH 8210 TV=PEEK(88)+PEEK(89)*256:DISP=TV-
   ADR(SCR$)
ZB 8220 POKE TV+7680,0:POKE ADR(SCR$)+768
   0,255
DR 8230 K=USR(MOVE,TV,ADR(SCR$),30):GOTO
   14000
IP 8600 REM
GM 8610 I=AXIS-INT(AXIS/3)*3+1
MQ 8620 J=I-INT(I/3)*3+1
DA 8630 CT=COS(THETA):ST=SIN(THETA)
LF 8640 A(AXIS,AXIS)=1:A(AXIS,I)=0:A(AXIS
   ,J)=0
LT 8650 A(I,AXIS)=0:A(I,I)=CT:A(I,J)=-ST
SY 8660 A(J,AXIS)=0:A(J,I)=ST:A(J,J)=CT
BN 8670 A(1,4)=0:A(2,4)=0:A(3,4)=0
BQ 8680 RETURN
IV 8900 REM
XE 8910 A(1,1)=V1:A(1,2)=0:A(1,3)=0:A(1,4
   )=0
OD 8920 A(2,1)=0:A(2,2)=V2:A(2,3)=0:A(2,4
   )=0
FR 8930 A(3,1)=0:A(3,2)=0:A(3,3)=V3:A(3,4
   )=0
BK 8940 RETURN
IE 9000 REM
IQ 9010 A(1,1)=1:A(1,2)=0:A(1,3)=0:A(1,4)
   =V1
NZ 9020 A(2,1)=0:A(2,2)=1:A(2,3)=0:A(2,4)
   =V2
TI 9030 A(3,1)=0:A(3,2)=0:A(3,3)=1:A(3,4)
   =V3
AT 9040 RETURN
IG 9100 REM
XG 9110 FOR I=1 TO 3
YK 9120 FOR J=1 TO 4
UO 9130 B(I,J)=A(I,1)*R(1,J)+A(I,2)*R(2,J
   )+A(I,3)*R(3,J)
FM 9140 NEXT J
SU 9150 B(I,4)=B(I,4)+A(I,4)
FR 9160 NEXT I
XY 9170 FOR I=1 TO 3
ZC 9180 FOR J=1 TO 4
DY 9190 R(I,J)=B(I,J)
FM 9200 NEXT J
FE 9210 NEXT I
AR 9220 RETURN
IK 9300 REM
CD 9310 R(1,1)=1:R(1,2)=0:R(1,3)=0:R(1,4)
   =0
FX 9320 R(2,1)=0:R(2,2)=1:R(2,3)=0:R(2,4)
   =0
JR 9330 R(3,1)=0:R(3,2)=0:R(3,3)=1:R(3,4)
   =0
AZ 9340 RETURN
BC 10000 REM
JG 10010 GOSUB 5140
XB 10020 GOSUB 5010:PRINT "SETTINGS INITI
   ALISED"
UY 10030 FOR I=1 TO 80:NEXT I:GOSUB 9300
EG 10040 GOSUB 5030:GOTO 500
BE 11000 REM
JI 11010 GOSUB 5140
SS 11020 GOSUB 5010:PRINT "ROTATION"
BK 11030 PRINT "ENTER X,Y,Z";:INPUT V1,V2
   ,V3
BF 11040 AXIS=1:THETA=V1:GOSUB 8600:GOSUB
    9100
CQ 11050 AXIS=2:THETA=V2:GOSUB 8600:GOSUB
    9100
EB 11060 AXIS=3:THETA=V3:GOSUB 8600:GOSUB
    9100
EU 11070 GOSUB 5030:GOTO 500
BG 12000 REM
JK 12010 GOSUB 5140
QU 12020 GOSUB 5010:PRINT "SCALE"
BM 12030 PRINT "ENTER X,Y,Z";:INPUT V1,V2
   ,V3
AK 12040 GOSUB 8900:GOSUB 9100
EO 12050 GOSUB 5030:GOTO 500
BI 13000 REM
JM 13010 GOSUB 5140
NL 13020 GOSUB 5010:PRINT "TRANSFORM"
BO 13030 PRINT "ENTER X,Y,Z";:INPUT V1,V2
   ,V3
WD 13040 GOSUB 9000:GOSUB 9100
EQ 13050 GOSUB 5030:GOTO 500
BK 14000 REM
MX 14010 GOSUB 5140:GOSUB 5010:PRINT "ENT
   ER FILENAME";:INPUT FN1$
DG 14020 FN2$=FN1$:FN3$=FN1$:I=LEN(FN1$)+
   1
QE 14030 FN$=FN1$
ZN 14040 FN1$(I)=".XYZ":FN2$(I)=".FAC":FN
   3$(I)=".CTL"
QZ 14050 PRINT "READING IMAGE FILE"
VT 14060 OPEN #1,4,0,FN3$
EN 14070 INPUT #1,V1,V2:NOF=V1:NOV=V2
RF 14080 CLOSE #1
UP 14090 OPEN #1,4,0,FN1$
WB 14100 FOR I=1 TO NOV
QH 14110 INPUT #1,V1,V2,V3:X(I)=V1:Y(I)=V
   2:Z(I)=V3
RO 14120 NEXT I:CLOSE #1
UP 14130 OPEN #1,4,0,FN2$
KJ 14140 FOR I=1 TO NOF
BT 14150 INPUT #1,V1:FACET(0,I)=V1
SW 14160 FOR J=1 TO V1
CX 14170 INPUT #1,V2:FACET(J,I)=V2
TW 14180 NEXT J:NEXT I:CLOSE #1
DL 14190 PRINT "IMAGE LOADED":GOSUB 5140
PK 14200 FOR I=1 TO 80:NEXT I:GOSUB 5030:
   GOTO 500
BM 15000 REM
JQ 15010 GOSUB 5140
ZM 15020 GOSUB 5010:PRINT "VIEWING SPECIF
   ICATIONS"
RF 15030 PRINT "SHADE (0-64)";:INPUT V1
LL 15040 IF V1<0 OR V1>64 THEN GOSUB 5160
   :GOTO 15020
IX 15050 POKE VALUE,V1
UL 15060 Q$="HALF-TONE (Y/N)":GOSUB 5100
JW 15070 POKE HTORRN,1:IF A$="N" THEN POK
   E HTORRN,0
XU 15080 Q$="WHITE EDGES (Y/N)":GOSUB 510
   0
IJ 15090 POKE MODE,0:IF A$="N" THEN POKE
   MODE,1
IQ 15100 GOSUB 5030:GOSUB 800:GOSUB 5140:
   GOTO 500
BO 16000 REM
JS 16010 GOSUB 5140
WY 16020 GOSUB 5010:PRINT "NUMBER OF DISP
   LAYS";:INPUT ND
HR 16030 Q$="FILING (Y/N)":GOSUB 5100:GOS
   UB 5050
MB 16040 POKE 559,0:GOSUB 5050
SD 16050 GOSUB 91:GOSUB 5140
QL 16060 GOSUB 300:GOSUB 5140
XC 16070 GOSUB 100:GOSUB 5140:POKE 559,34
TG 16080 GOSUB 800:GOSUB 5140
HM 16090 IF A$="Y" THEN GOSUB 5010:PRINT
   "FILING - PLEASE WAIT":GOSUB 20:GOSUB
   5030:GOSUB 5140
RI 16100 ND=ND-1:IF ND<>0 THEN 16040
SP 16110 GOTO 500
BE 20000 DIM SCR$(7681),FACET(4,98),A(3,4
   ),B(3,4),R(3,4)
SY 20010 DIM X(98),Y(98),Z(98),STG(98),SA
   Z(98),PK(2,3)
BC 20020 DIM FN1$(20),FN2$(20),FN3$(20),F
   N$(20)
DT 20030 DIM Q$(30),A$(1)
DO 20040 RETURN
```

```
EI 1 REM ******************************
SH 2 REM *       THE 3-D ANIMATOR       *
RN 3 REM *     by Philip Robinson       *
EO 4 REM *     ------------------       *
WE 5 REM *          LISTING 7           *
ED 6 REM * ---------------------------- *
JA 7 REM *  PAGE 6 MAGAZINE - ENGLAND   *
EP 8 REM ******************************
MU 10 GOTO 1000
BX 20 POKE 764,0:K=USR(8851,ADR(D$))
KT 30 ADDR=PEEK(204)+PEEK(205)*256
ZH 40 POKE 764,255:K=USR(8851,ADDR)
ZB 50 IF PEEK(764)<>56 THEN POKE 764,255:
   RUN "D:MENU.3D"
QR 60 POKE 764,255:GOSUB 5140:GOSUB 5010:
   PRINT "ENTER FRAME DELAY(1-256)";:INPU
   T FD
DB 70 IF FD<1 OR FD>256 THEN GOSUB 5160:G
   OTO 60
IV 80 IF FD=256 THEN FD=0
GJ 90 POKE 8882,FD:GOSUB 5050:GOTO 20
SX 1000 REM INITIALISE
VV 1010 DIM D$(22000),FN$(20)
YA 1020 GOSUB 5050:GOSUB 5010:GOSUB 5140
HL 1030 PRINT "ENTER FILENAME";:INPUT FN$
JI 1040 PRINT "READING DATA"
NV 1050 OPEN #1,4,0,FN$
VP 1060 K=USR(8969,ADR(D$))
DC 1070 CLOSE #1:GOSUB 5030:POKE 8882,0
QB 1080 GOTO 20
EP 5000 REM GRAPHIC SETTINGS
GE 5010 REM SETUP TEST WINDOW
JP 5020 GRAPHICS 40:GOSUB 5070:? :? :?
   :RETURN
BK 5030 REM REMOVE TEXT WINDOW
VG 5040 GRAPHICS 56:GOSUB 5070:RETURN
CS 5050 REM CLEAR SCREEN
SN 5060 GRAPHICS 24:GOSUB 5070:RETURN
NN 5070 REM SET COLOUR REGS.
YV 5080 SETCOLOR 2,0,0:SETCOLOR 1,0,15:CO
   LOR 1
BE 5090 RETURN
VA 5140 REM BEEP OK
IY 5150 SOUND 1,30,10,8:FOR I=1 TO 50:NEX
   T I:GOTO 5180
GA 5160 REM BEEP ERROR
UU 5170 SOUND 1,50,6,8:FOR I=1 TO 150:NEX
   T I
YQ 5180 SOUND 1,0,0,0:RETURN
```

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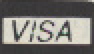
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DESERT CHASE

a weird and challenging blast 'em game by Guy Aitchison

You play Fred, a Kansas wheat farmer who is paid for not growing wheat. While not plowing the fields one afternoon, Fred and his dog, Tito, are consumed by a violent tornado. It brings them to a musical, colourful, land populated by magical elves who sing, dance and use TYPO 3.

These elves are being annoyed by an evil band of witches who live in a desert on the other side of the planet. Most every day, the bad witches shortsheet the elves' beds, hide their morning newspapers and fly around yelling 'Hey shorty, your mother's a fire hydrant!'

Your mission: You and Tito must fly the elves' patent-bending, brass-plated, sodium-powered, warp-driven, salad-spinning, nuclear destructo-blaster space cruiser deep into enemy territory, and ...

DESTROY ALL WITCHES!

But first, type in the Listing, checking it with TYPO 3 as you go, then SAVE or CSAVE a copy before you RUN the program.

Until you came along, the elves only used their destructo-blaster cruiser for shopping trips and pleasant Sunday afternoon picnics in the surrounding countryside. Hence, it has a rather small fuel tank. When you run out of fuel, you crash and explode.

To compensate for this, the elves received a multi-trillion dollar government grant to develop the Sodium-Depleting Instrument (SDI). Upon contact with a witches spaceship, SDI removes *all* sodium from the witch fuel tank and transfers it to yours. Without fuel, the witches ship quickly loses power and blows up. What fun!

Your ship's radar (controlled by a type-in computer program from a popular Atari magazine) can detect a witch's ship before you can see it on the horizon. Use the radar wisely.

The SDI has a maximum range of 400 metres and a minimum range of 100 metres. Push the joystick forward to hit distant targets, pull back to hit the closer ones. Press the joystick button to fire the SDI. The indicator at the bottom of the screen tells you how far your SDI will travel before it hits the ground. Each witch's ship carries 30 gallons of sodium.

Witches attack in waves of three screens each. Destroying all the witches on three consecutive screens allows you to advance to the next wave. If you fail to destroy a fleet of witches, they'll turn you into a toad and blow you up.

Your score, remaining fuel, and wave number are indicated at the top of the screen. There's no turning back. Strap Tito into the Navigator's seat, fire your engines, and begin your witch hunt.

Oh yes, and don't forget your ruby slippers!

Desert Chase first appeared in ANTIC magazine Volume 5 No. 3 and is reprinted with ANTIC's permission under an exchange agreement with PAGE 6. Program author Guy Aitchison lives in Illinois and had been programming his Atari for two years at the time he wrote the game. The article is by ANTIC Program Editor Charles Jackson.

```
EI 1 REM ********************************
HE 2 REM *         DESERT CHASE         *
WJ 3 REM *       by Guy Aitchison       *
OM 4 REM *  (c) 1986 ANTIC PUBLISHING   *
EC 5 REM * ---------------------------- *
UR 6 REM * Republished with permission *
NW 7 REM *    BY PAGE 6 - ENGLAND       *
EP 8 REM ********************************
PE 9 SE=35:DIM A$(2),B$(2),C$(2),D$(2):YE
   =10:SK=0:SN=1:POKE 106,PEEK(740)
SQ 10 POKE 106,PEEK(106)-5:GRAPHICS 0:DL=
   (PEEK(106)+1)*256:POKE 756,DL/256+2:DM
   =PEEK(560)+PEEK(561)*256+6
BB 12 FOR I=0 TO 22:POKE DM+I,4:NEXT I:FO
   R I=128 TO 500:POKE DL+I,PEEK(57344+I)
   :NEXT I
WA 13 FOR I=1 TO 28:READ O:P=(O+64)*8:FOR
    A=0 TO 7:READ X:POKE A+P+DL,X:NEXT A:
   NEXT I:GOSUB 900:VL=0:VH=2
OK 41 POKE DM+5,2:POKE DM+2,5:POKE DM+3,5
   :POKE DM+6,2:F=999:Q=28:LOCATE 0,0,C:G
   OSUB 700
CV 47 SOUND 0,255,10,4:SOUND 1,250,10,4:S
   OUND 2,34,0,4:Z=0
ZL 50 C=C+1:IF C>2 THEN C=0:IF STICK(0)=1
   4 OR STICK(0)=13 THEN GOSUB 100
VE 51 IF C=2 THEN POKE 708,Z+4:POKE 709,Z
   +6:POKE 711,Z+8
XK 52 IF C=1 THEN POKE 709,Z+4:POKE 711,Z
   +6:POKE 708,Z+8
BD 53 IF C=0 THEN POKE 711,Z+4:POKE 708,Z
   +6:POKE 709,Z+8
HY 60 S=STICK(0):X=X-3*(S=11 AND X>60)+3*
   (S=7 AND X<166):POKE 53248,X:POKE 5324
   9,X+14
JJ 70 IF STRIG(0)=0 AND FF=0 THEN GOSUB 8
   00
GQ 71 IF FF=1 THEN GOSUB 810
GP 80 G=G+1:IF G>SE THEN G=0:GOSUB 600
NY 98 F=F-1:POSITION 11,0:? F;" ":IF F<1
   THEN 9999
TS 99 GOTO 50
CT 100 IF STICK(0)=14 THEN W=W+100:IF W>4
   00 THEN W=100
CT 101 IF STICK(0)=13 THEN W=W-100:IF W<1
   00 THEN W=400
WS 102 POSITION 18,22:? "D=";W:RETURN
GL 200 SK=0:SN=4:SE=SE-0.5:GG=GG+1:IF GG>
   2 THEN GG=0:WA=WA+1:Z=Z+16:IF Z>248 TH
   EN Z=0
TS 202 X1=INT(14*RND(0)+3)*2:X2=INT(14*RN
   D(0)+3)*2:X3=INT(14*RND(0)+3)*2:X4=INT
   (14*RND(0)+3)*2
QX 203 X5=INT(14*RND(0)+3)*2:IF WA<5 THEN
    X5=99:SN=3
ZN 204 IF WA<3 THEN X4=99:SN=2
XA 205 IF WA<1 THEN X3=99:SN=1
```

```
EM 209 YE=10:POSITION 34,0:? WA+1:RETURN
OO 500 COLOR 97:PLOT 1,18:DRAWTO 39,18
XH 501 SOUND 0,0,0,0:SOUND 1,0,0,0:SOUND
   2,100,4,14
KR 502 RESTORE 1010:FOR I=11 TO 20:READ C
   :COLOR C+128:PLOT 0,I:DRAWTO 39,I:NEXT
    I
IE 503 FOR I=1 TO 100:POKE 704,I:POKE 705
   ,I:NEXT I:POKE 53248,0:POKE 53249,0:CO
   LOR 4
CH 504 PLOT 0,18:DRAWTO 39,18:GOTO 9999
FS 600 YE=YE+1:IF YE=11 THEN A$="▄▝":B$="
   ██":C$="▀▙"
IC 601 IF YE=12 THEN A$="▀█":B$="▀▙":C$="
   ▜▛":D$="▐▌"
FP 602 IF YE=13 THEN A$="▜▛":B$="▜▛":C$="
   ▀▙":D$="██"
CB 603 IF YE=14 THEN A$="▛▀":B$="▜▛":C$="
   ▞▞":D$="▀▙"
EM 604 IF YE=15 THEN A$="▀█":B$="▀▀":C$="
   █▀":D$="▜▛"
OV 605 IF YE=16 THEN 500
TC 606 IF X1<99 THEN POSITION X1,YE:? A$:
   POSITION X1,YE+1:? B$:POSITION X1,YE+2
   :? C$:IF YE>11 THEN GOSUB 624
JD 607 IF X2<99 THEN POSITION X2,YE:? A$:
   POSITION X2,YE+1:? B$:POSITION X2,YE+2
   :? C$:IF YE>11 THEN GOSUB 620
TJ 608 IF X3<99 THEN POSITION X3,YE:? A$:
   POSITION X3,YE+1:? B$:POSITION X3,YE+2
   :? C$:IF YE>11 THEN GOSUB 621
DP 609 IF X4<99 THEN POSITION X4,YE:? A$:
   POSITION X4,YE+1:? B$:POSITION X4,YE+2
   :? C$:IF YE>11 THEN GOSUB 622
MT 610 IF X5<99 THEN POSITION X5,YE:? A$:
   POSITION X5,YE+1:? B$:POSITION X5,YE+2
   :? C$:IF YE>11 THEN GOSUB 623
AF 619 RETURN
UC 620 POSITION X2,YE-1:? D$:RETURN
UU 621 POSITION X3,YE-1:? D$:RETURN
VM 622 POSITION X4,YE-1:? D$:RETURN
WE 623 POSITION X5,YE-1:? D$:RETURN
TZ 624 POSITION X1,YE-1:? D$:RETURN
IC 700 POSITION 14,3:? " DESERT CHASE ":P
   OSITION 12,4:? " BY GUY AITCHISON "
LD 701 SOUND 0,255,10,14:SOUND 1,254,10,1
   4:SOUND 2,10,10,14:POKE 53768,14
EK 702 C=C+1:IF C>2 THEN C=0
NX 703 IF C=2 THEN POKE 708,Z+4:POKE 709,
   Z+6:POKE 711,Z+8
QD 704 IF C=1 THEN POKE 709,Z+4:POKE 711,
   Z+6:POKE 708,Z+8
TW 705 IF C=0 THEN POKE 711,Z+4:POKE 708,
   Z+6:POKE 709,Z+8
TY 706 Z=Z+16:IF Z>248 THEN Z=0
IF 707 IF STRIG(0)=0 THEN SOUND 0,0,0,0:S
   OUND 1,0,0,0:SOUND 2,0,0,0:Z=0:GOTO 71
   0
PT 709 GOTO 702
LR 710 POSITION 14,3:? "//////////////":P
   OSITION 12,4:? "//////////////////":PO
   P :GOTO 47
VM 800 FF=1:POKE 53250,X+10:XX=X+10:RESTO
   RE 2000:Y=175
EY 802 IF W=400 THEN SP=8
DV 803 IF W=300 THEN SP=7
CS 804 IF W=200 THEN SP=6
BP 805 IF W=100 THEN SP=5
AF 809 RETURN
EL 810 SP=SP-1:Y=Y-SP:READ N:IF N=256 THE
   N POKE PM+512+Y+SP,0:FF=0:GOSUB 820:RE
   TURN
HP 812 POKE PM+512+Y,N:POKE PM+512+Y+SP,0
   :RETURN
XF 820 IF W=400 AND YE=12 OR W=300 AND YE
   =13 OR W=200 AND YE=14 OR W=100 AND YE
   =15 THEN 822
ZL 821 RETURN
EC 822 H=INT((XX/4)-11):J=H-1:IF H=X1 OR
   J=X1 THEN HJ=1:GOTO 830
VG 823 IF H=X2 OR J=X2 THEN HJ=2:GOTO 830
XQ 824 IF H=X3 OR J=X3 THEN HJ=3:GOTO 830
AA 825 IF H=X4 OR J=X4 THEN HJ=4:GOTO 830
CK 826 IF H=X5 OR J=X5 THEN HJ=5:GOTO 830
AJ 829 RETURN
XR 830 POKE 710,14:SOUND 3,20,0,14:IF HJ=
   1 THEN XC=X1:X1=99
WN 831 IF HJ=2 THEN XC=X2:X2=99
YW 832 IF HJ=3 THEN XC=X3:X3=99
BF 833 IF HJ=4 THEN XC=X4:X4=99
DO 834 IF HJ=5 THEN XC=X5:X5=99
AS 835 RESTORE 1010:FOR I=11 TO 20:READ C
   :COLOR C+128:PLOT XC,I:PLOT XC+1,I:NEX
   T I:F=F+30:SOUND 3,0,0,0
UD 836 SK=SK+1:IF SK>SN THEN SK=0:GOSUB 2
   00
DN 837 POKE 710,100:SC=SC+(YE*10):POSITIO
   N 23,0:? SC:RETURN
HL 900 POSITION 0,0:? "     ":POKE 710,100
   :POKE 752,1
MU 901 FOR I=1 TO 5:COLOR 6:PLOT 0,I:DRAW
   TO 39,I:NEXT I:FOR I=8 TO 10:PLOT 0,I:
   DRAWTO 39,I:NEXT I
KG 902 POSITION 0,10:? "◣◢◣/◢//◢◣◢◣/◢///
   ◢◣/◣◢◣◢◣/◢◣/◣◢◣///////"
CS 903 FOR I=11 TO 23:READ C:COLOR C+128:
   PLOT 0,I:DRAWTO 39,I:NEXT I
CH 910 POKE 559,62:POKE 53277,3:PM=INT(PE
   EK(742)/4-2)*1024:POKE 623,1:POKE 5427
   9,(PM/256)-4
NQ 911 RESTORE 1020:FOR I=177 TO 220 STEP
    2:READ X:POKE I+PM,X:POKE I+PM+1,X:NE
   XT I
VB 912 FOR I=177 TO 220 STEP 2:READ X:POK
   E I+PM+256,X:POKE I+PM+257,X:NEXT I
GV 913 POKE 53248,114:POKE 53249,130:X=11
   4:POKE 53256,1:POKE 53257,1
JE 980 W=100:POSITION 18,22:? "D=";W
LM 989 POSITION 0,6
WF 990 ? " ◣▝                          ◣▀        ◣▝
   "
VW 991 ? "      ◣◥▀     ◣▀
   ◣◥▀"
PN 992 X1=16:X2=24:X3=99:X4=99:X5=99
DE 997 POSITION 5,0:? "FUEL= 999  SCORE=
   0     WAVE= 1 ":POKE 706,28:SP=5:RETURN
OJ 1000 DATA 0,0,0,0,0,0,0,0,1,0,0,0,17
   0,85,255,170,170,2,85,85,255,255,170,1
   70,170,170,3,85,85,85,85
AM 1001 DATA 255,255,255,255,4,170,170,17
   0,170,170,170,170,170,5,85,85,85,85,85
   ,85,85,85,6,255,255,255,255
XW 1002 DATA 255,255,255,255,7,255,255,25
   5,243,243,192,192,0,8,252,252,252,240,
   192,192,0,0,9,255,63,15,3,3,0,0,0
NP 1003 DATA 10,1,27,63,63,127,255,62,0,1
   1,128,192,193,227,247,255,12,0,12,0,0,
   128,128,204,255,224,0
ZH 1004 DATA 13,0,16,0,170,69,255,170,170
   ,14,85,85,195,195,170,170,130,170,15,8
   5,80,64,64,255,255,192,255
HT 1005 DATA 16,85,85,21,21,255,255,63,25
   5,17,168,160,160,162,128,170,170,160,1
   8,42,10,10,138,2,170,170,10
VK 1006 DATA 19,64,84,85,85,85,85,85,85,2
   0,1,5,85,85,85,85,85,85
PG 1007 DATA 21,85,85,85,85,85,84,80,64,2
   2,85,85,85,85,21,5,1,23,192,192,195
   ,207,0,240,255,255
DV 1008 DATA 24,3,3,195,243,0,15,255,255,
   25,255,255,192,0,192,255,255,255,26,25
   5,255,3,0,3,255,255,255
AH 1009 DATA 33,170,74,8,162,8,74,170,171
MY 1010 DATA 1,2,3,4,5,6,6,4,4,4,5,5,5,5,
   5
FK 1020 DATA 1,1,27,50,117,157,235,150,24
   6,103,3,0,0,0,0,0,0,1,19,119,255,247
KN 1021 DATA 128,128,216,76,174,185,215,1
   05,111,230,192,0,0,0,0,0,0,128,200,238
   ,255,239,239
IV 2000 DATA 255,255,255,126,126,60,60,24
   ,24,0,0,256
PV 9999 SOUND 0,0,0,0:SOUND 1,0,0,0:SOUND
    2,0,0,0:SOUND 3,0,0,0:POSITION 1,6:?
   "             GAME OVER              "
RG 10000 POKE 709,Z+8:FOR I=512 TO 512+25
   6:POKE PM+I,0:NEXT I:POKE 704,0:POKE 7
   05,0:SC=0:F=999
DC 10001 SE=35:SK=0:SN=1:WA=0:YE=10:Z=0:P
   OSITION 34,0:? "1  ":FF=0
OW 10002 POSITION 0,6:? " ◣▝
       ◣▀        ◣▝":X1=15:X2=25:X3=99:X4=
   99:X5=99
YJ 10003 X=114:POKE 53248,114:POKE 53249,
   130:POSITION 23,0:? "0     ":POSITION 1
   1,0:? "999 ":GOTO 700
```

THIS is the 21st CENTURY ...THIS IS WAR!

This is the 21st Century where the right of way goes to the biggest guns. The roads are controlled by warring gangs. No travel is safe. To survive a journey between towns you need a heavily armoured car bristling with weapons. Your country is depending on you. You will need to learn how to survive in this harsh new world, indeed not only survive, but amass enough worldly goods to ensure you can create a powerful enough force to fulfill your many missions. You will need to learn about the towns and cities of this future time, how to get what you need without making too many enemies, how to follow the clues which will take you to your final mission; how to handle the detailed road fights when you are attacked by a gang of enemy vehicles, probably outnumbered and outgunned. If you have learnt your skills well you can still triumph.

So, which game am I talking about? Roadwar 2000 or Autoduel? Well, both, actually. This is a prime example of how two different groups of people can take the same theme and create two entirely different games. Both are excellent games and will appeal to a very wide audience. Both are sophisticated war games with a basic requirement of learning how to survive and grow, while searching the cities for clues so that you can complete your final quest. All the details and game play are, however, very different in the two games and one over-riding difference is in how detailed combat takes place. In Autoduel fighting is done either voluntarily in the city arenas or forcibly while travelling between cities. You have a single car which you control with a joystick, shooting with the fire button and switching weapons with the space bar.

The fights are, basically, sophisticated arcade games. Roadwar 2000 does not use a joystick at all. The most detailed fights, which can take place in a variety of terrains, involve numerous cars on each side and are controlled by single key commands to accelerate, brake, turn and move each car during the movement phase and single key commands to choose a target and fire in the firing phase.

If you are hopeless with a joystick and can never successfully develop the motor (no pun intended!) skills necessary to win arcade games you should avoid Autoduel. If you don't have the patience to read and understand some fairly sophisticated movement, firing and boarding rules and comprehensive (21 per vehicle!) vehicle statistics, or the patience to spend well over five minutes (and quite possibly half an hour!) on a single fight, then you should avoid Roadwar 2000. Otherwise, you may well enjoy both – read on and try to decide which one to buy first!

Where did it all start? Which came first – Mad Max or Judge Dredd? Whichever it was, the idea of a future controlled by warring road gangs seems to have gained significant popularity in gaming circles. Apart from the computer variations you can also buy board games such as Thunderroads (MB Games), Battlecars (Games Workshop) and Car Wars (Steve Jackson Games). Autoduel is actually based directly on Car Wars, so let's look at that first.

John Sweeney takes a look at a new genre of computer software – the futuristic wargame. Autoduel and Roadwar 2000 are leading examples of the genre and John has delved deep into both

AUTODUEL

"Drive offensively – The life you save may be your own".

You start by creating a new character and allocating 50 points between Driving, Marksmanship and Mechanical skills. Shortly thereafter you will be presented with a bird's eye view of your character walking round New York. Ctrl-D will show you your current statistics: $2000, low skills, no armour, and no clone to take over if you get killed. In order to win you will have to improve all of these areas. You should ignore the rather complex section in the middle of the excellent instruction manual for the moment. This covers all the details of how to design your own car, how to arm it, and how to use the varied weaponry but you can't afford it yet! If you are the gambling type you could hop on a bus to Atlantic City and try your hand at Black Jack or Poker, otherwise you should head for the Arena, pausing only long enough to buy some body armour at the Truck Stop. Provided you haven't wasted too much time you should find that it is Amateur Night – the only night you can get in without your own car. They will lend you a Killer Kart – a fairly low grade machine with little armour and only one weapon, a front-mounted machine gun. Fortunately your opponents only get Killer Karts too!

So far, apart from using the joystick to move around the streets of New York (which seems to have shrunk a bit by the year 2030 – it only takes up one screen!) you will have been using the keyboard to select items from numbered lists in the establishments you have visited. Now the fun starts – you are into an arcade game driving your Killer Kart around a vast scrolling arena searching and destroying the other amateurs. The borders of the screen are a mass of control panels indicating your weapons, your battery charge, your speed and the remaining hit points on the front, back, left, right, and



underside armour of the car, each wheel, your power plant and YOU! You also have a small radar screen to help you find the enemy. As you drive around the arena, avoiding the fences and obstacles you will eventually come face to face with the enemy – blast and dodge and may the better man win! Unfortunately there are five of them and only one of you – not very fair really. You have limited ammo, the status of which you can check with a Ctrl-C (which will tell you all about the car design as well, but don't worry about that yet – survival is all you should care about at this stage!).

FIRST GET SOME MONEY

Getting started at Autoduel is not easy – you are unlikely to emerge as an Amateur Night Champion on the first few tries, but once you get the hang of it you will earn yourself $1500 and some prestige. Prestige and your various skills will normally increase whenever you succeed at anything. This is important as you need prestige to get some of the important jobs, driving skills to get better control of your car, mechanical skills to enable better salvaging of wrecks (both for spare ammo and to make money), and marksmanship to improve your shooting – it is worth noting that the computer is obviously 'throwing lots of dice' to decide whether or not you hit since sometimes a shot will miss on the screen but still have devastating effect, and vice versa – these 'dice throws' are heavily biased by your marksmanship.

Amateur Nights come round fairly frequently so you should soon be able to amass enough money to go and build your own car, fortunately there is an Assembly Line in New York, so you don't have far to go. (Your prestige will probably have reached six by now, so you can forget about Amateur Nights unless you run low on cash.) Now you need to read about car design. You have to choose from seven body types, then decide on the quality of the chassis, the suspension, the power plant, the tyres, the weaponry and the armour! Fortunately the foreman understands the principles of car design even if you don't and will keep constant track of the space, weight and cost of your new car.

You first need to decide what you want the car for – the game allows plenty of scope in what you do next. There are sixteen cities scattered across the Northeast of the USA which you can visit. Nine of them have arenas for you to fight in, eight have branches of the AADA (the American Autoduel Association) which will offer you courier jobs which can be extremely lucrative (up to $15000!) if you get the goods to the right destination in one piece and on time, and there are also the roads between the cities, which need clearing of outlaws. On the fold-out map you get with the game the roads are shown as nice straight white lines – don't be fooled by these. All 'roads' are arcade-time again and are actually tangled mazes of roads, some dead ends, some overgrown with forests or littered with boulders – taking a wrong turning can add 400 miles to your journey and if your power supply wasn't fully charged that probably means you won't make it. These roads are NOT safe for pedestrians! (Actually, if you do run out of gas you can cheat a little – just Q(uit and save) and restart – you will find yourself back in the previous city!.) The roads are also the natural habitat of the deadly road gangs. These guys aren't limited to Killer Karts with machine guns – here you will meet limousines armed with lasers, rocket launchers, minedroppers and anything else that money can buy!

WHAT ARE YOUR PLANS?

The arenas likewise offer a lot more than just amateur nights, there are Divisions 5, 10, 15 and 20 for cars of total value up to $5,000, $10,000, $15,000 and $20,000 respectively, plus unlimited nights and, every three months, the City Championships.

So, before you build your car you must decide – are your initial plans to be a vigilante, an arena champion, or a courier, and if you are a courier are you going to be a rabbit or a turtle? – do you want armour or weapons or speed? Even when you have a vast fortune you will find the game is designed cleverly enough to prevent you building the perfect car – either too much armour will reduce your acceleration, or you won't have space for all the weapons you want. You always have to balance your desires against what is practical. And when you start out your main limitation will be your bank balance! Also, beware of building a car which is midway between two divisions. If you spend $6,000 on a car they won't let you into Division 5 and you will find yourself outclassed in Division 10. The only change you can make to a car after it is built is to add weapons (money, space and weight permitting!). Once you are rich you can of course have lots of cars, the garages will look after the spare ones for you (for a small fee) and you can keep different ones for different purposes or sell them for scrap.

One of the best aspects of the game is the range of weaponry, both offensive and defensive: Machine Guns, Flamethrowers, Rocket Launchers, Recoiless Rifles, Anti-Tank Guns, Lasers, Minedroppers, Spikedroppers, Smokescreen, Paint Sprays, Oil Jets and Heavy Rockets. Each has its own characteristics and uses. You can have up to ten weapons, mounted on the front, sides or back of your car – I especially liked the flamethrower, even if the long blast of

flame misses the enemy car, the resulting cloud hangs about on the screen and may blind him! The Arena fights and road fights with gangs of cars are excellent arcade games once you have a nice variety of weaponry to throw at the enemy!

So what's it all about? Keep your ears open for rumours and secret information at the Truck Stops and Bars and you should eventually learn of some special courier jobs which are well worth taking. There are also rumours of a Mr. Big who runs the Eastern sea-board outlaws – maybe your final quest will have something to do with him!

ONE SLIGHT CRITICISM

My only slight criticism with the game play is that, once you have fully mapped the roads, got a good enough car, and learnt how to use it to get past the road gangs, then some of the drives between cities, which can still take five or ten minutes become a tiny bit tedious as you watch mile after mile of similar looking road scroll slowly past, but by the time you get to that stage you should have nearly completed your quest, so hopefully you won't have too many such journeys.

Two points on the documentation. First, for Ctrl-A read Ctrl-R and secondly, the detailed notes on Saving characters don't fully explain how to retrieve a saved character if he has died – the Q command to quit and save to the B-side only allows you to resume once. If your character dies you will not be able to reload him again. Obviously you can copy your B-side, but that takes a long time. The simplest way is to Quit (which saves your character to the B-side), restart, select Activate Old Driver, reply Yes you do want to save your current driver, wait while it loads him into memory, insert a formatted disk when prompted, wait while it saves him to it. Now when it asks for the disk with the new driver to be inserted just press enter to use the character you have just saved. The big difference now is that the version of him on the formatted disk is NOT destroyed by loading. If he now dies you can re-Activate him from that formatted disk as many times as you like.

The XL/XE version is in black and white; the ST version is in colour and also allows you to use the F-keys instead of trying to reach ridiculous combinations like Ctrl-L with one hand! The only other difference between the two versions that I could spot is that the ST allows you to use a mouse, but since they didn't complete the job you will need to reach for the keyboard occasionally to speed up messages with the space bar and to reply to questions with Y or N. Whether you can fight duels with a mouse is another matter, I found the joystick much easier, but I am sure it is possible to develop the appropriate skills to succeed with a mouse-driven car!

Autoduel comes from Lord British and Chuckles who brought us the superb Ultima series – and while you shouldn't expect the depth of the Ultima games – you should expect many very entertaining hours of Autodueling.

AUTODUEL
Origin Systems Inc. (Microprose)
Disk
Price £24.95 (ST)
£19.95 (XL/XE)

NEXT ISSUE ... an in depth look at Roadwar 2000, same theme but a totally different game.

WHAT HAVE YOU MISSED?

BACK ISSUES

PAGE 6 back issues represent an excellent way of increasing the enjoyment of your Atari with articles to enlighten you, programs to type in and reviews of software to guide you. Almost all of the content of past issues will be as fresh and relevant today as when it appeared – increase your enjoyment now, before it's too late!

ISSUE 20 – GRAPHICS SPECIAL. A super special issue with a graphics theme. Draw some masterpieces with GRAPHICS WORKSHOP and explore your graphics potential with Colour Palette, Picloada, Colour Attributes and CIO Slideshow. An in-depth review of Printshop and Graphics Art Department, the final part of Display Lists and the Adventure column. 11 pages devoted to the ST plus a colour feature ATARI ART and ST GALLERY. And there's more! BLOCKBREAKER is one of the best games to have been published in any magazine. Don't miss it!

ISSUE 21 – A packed issue with games, TRAIN CRAZY, Revenger and Forklift. Utilities Scalemaster, Quick Disassembler and Measuring Temperature. Programming hints with Doing The Impossible, Error 8 Solved and THE GUIDE TO ERROR CODES. Reviews of Flight Simulator II, Hitchhiker's Guide to the Galaxy, and the latest Adventures. For the ST a DEGAS to NEO converter, Lattice C reviewed and reviews of a whole host of software.

ISSUE 22 – More serious users will enjoy SMARTSHEET, a Visicalc like type-in spreadsheet, and our review of Paperclip whilst gamesters will puzzle over Tricky Cubes and try to survive Hidden Depths. The Guide to Error Codes is concluded and there are articles on Fractals, Tape Problems and some less well known Adventures. Loads of reviews and some great new routines for Blockbreaker. ST users will find out how to program Sprites and can read reviews on Time Bandit, Pro-Fortran 77, VIP Professional and more.

ISSUE 23 – Another superb machine language game Water Ski School will test your reflexes. Wordsearch will challenge those who like puzzles and other listings include Superclown and the utilities Xref and Verify. A huge review of Ultima IV heads a comprehensive review section and Going Online Part 1 will let you know if telecommunications is for you. ST owners can discover how to get a bigger screen on their colour monitor and read reviews of Zoomracks, Sierra On-Line adventures and Pro-Pascal amongst others. Also, is it worth adding a 5¼" drive to your ST?

ISSUE 24 – The biggest issue so far published! Great ST section with info about ST disks and cartridges and loads of reviews. For 8-bit users there is MUNCHY MADNESS, the best game we have ever published plus a super cheque book utility AUTOCHECK. Plus all about checking your disk drive, another game, more utilities, reviews of RAMBIT, Adventure games and lots more. Too much in this issue to list fully!

ISSUE 25 – Another biggie! A must for 1029 printer owners with 3 great utilities including a screen dump. A super Japanese chess game called SHOGI, a type in REVISION C BASIC, a full feature on disks and more. For ST, type in OTHELLO, reviews of LEADER BOARD and MEAN 18, Hints and Tips and several other reviews and articles.

ISSUE 26 – SOLID MODELLING is one of the best programs we have published. Be creative! Other programs include SOURCE WRITER for machine code programmers, FLEXIBLE FINGERS to help you type, NUTS and more. Reviews of TRIVIAL PURSUIT, DVC 65, SPEEDSCRIPT and much, much more. ST users can learn all about HARD DISKS, FAST BASIC, TYPESETTER ELITE, DEGAS ELITE and read reviews on a whole lot more software.

ISSUE 27 - Some cracking listings for the 8-bit. In GREAT BRITAIN LTD. you can be the Chancellor and help run the country. COMPUTER GAMMON is a great Atari version of backgammon and there's ANTS IN YOUR PANTS, DISK COMMAND and others. There is a feature on word processing and stacks of reviews. The ST section includes an in-depth review of ART DIRECTOR and a neat little program to put scrolling stars on your screen! Lots of reviews including HABAVIEW, K-SPREAD 2, K-WORD and many more.

ISSUE 28 - Extend the incredible original Munchy Madness with the MUNCHY MADNESS SCREEN DESIGNER, play GREEDY CATERPILLARS with a friend, teach your children with MOST HEART MATHS or make up some crosswords with XWORD. A long feature on flight simulation programs, hints on ZORK and loads of reviews. For ST users, the first in a series of USING GEM from C plus FLIGHT SIMULATOR II reviews, new books from COMPUTE! and a whole stack of reviews.

ISSUE 29 - One that serious 8-bit users have been waiting a long time for – a great full feature database – MJDBASE plus an amazing story maker, STORYBOOK, that allows you to create illustrated stories. Then there's a great game from ANTI called CLIFFHANGER and an AUTORUN maker and more. Cheat on commercial games with ZAPPING THE RIGHT BYTE and read stacks of reviews. The ST section has a type-in program, SCREEN GRABBER, which allows you to 'snatch' pictures of commercial games to disk, plus the next part in our GEM FROM C series and reviews of Superbase Personal, K-COMM 2 plus lots of games including Barbarian.

All back issues are £1.20 each in the U.K., £1.95 for Europe or surface mail elsewhere and £2.75 for Air Mail outside Europe. Please make cheques/postal orders payable to PAGE 6. Send your order to PAGE 6, P.O. BOX 54, STAFFORD, ST16 1DR, ENGLAND.

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ISSUE 19 – Contains SNOWFALL, THE CHASE, MAGFILE, SECTOR 10, STARKIES UTILITIES plus programs for the Speech Synthesiser and several programs on Display Lists.

ISSUE 20 – Contains BLOCKBREAKER, GRAPHICS WORKSHOP, COLOUR PALETTE, PICLOADA, COLOUR ATTRIBUTES, CIO SLIDE SHOW plus more Display List programs and pictures for Graphics Workshop.

ISSUE 21 – Contains REVENGER, TRAIN CRAZY, FORKLIFT, SCALEMASTER, DOING THE IMPOSSIBLE, QUICK DISASSEMBLER and MEASURING TEMPERATURE.

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ISSUE 25 – Contains the chess program SHOGI, a page flipping demo, BOUNCING BERT, and three 1029 printer utilities, LIST 1029, SCREEN DUMP and SMALL FONT. A must for all 1029 owners.

ISSUE 26 – TWO virtually full sides with bonus screens for SOLID MODELLING! Check them out. Also SOURCE WRITER for machine code programmers, FLEXIBLE FINGERS to help you type, a game of NUTS, DESIGNER LABELS for EPSON printers and YOUR OWN CURSOR plus any others in this issue.

ISSUE 27 - Long listings include GREAT BRITAIN LTD. and COMPUTER GAMMON, two excellent programs. DISK COMMAND adds new commands to BASIC and TIMESCREEN will give you a new screen with a clock for typing in those programs. Plus all the other bits and pieces on a full disk.

ISSUE 28 - The amazing MUNCHY MADNESS SCREEN DESIGNER ready to run, a RAMDISK MOVER for your 130XE, MOST HEART MATHS for you or the children, XWORD to get you thinking plus all the other programs from this issue on a disk packed, as usual, to the brim. Also contains the winning title screen from our recent competition.

ISSUE 29 - That super database MJDBASE is here ready to run and STORYBOOK is here with a great bonus on the back of the disk – a STORYBOOK READER with a complete story for you or the kids. INSTANT CHARACTER SETS, CLIFFHANGER and AUTOMAKE are also on the disk together with all the little programs from this issue. Another two sided disk but at the same price and the same great value.

ISSUE 30 - All the programs from this issue **PLUS BONUS MACHINE LANGUAGE ADVENTURE ONLY AVAILABLE ON THE DISK**

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Review

ICD P:R:Connection

If, like me, you've always cursed Atari for not providing the 8-bit machines with standard serial and parallel interfaces, then you'll be interested in the P:R:Connection from ICD Inc. of Rockford, Illinois. Using this device you'll be able to connect to standard (non-Atari) printers, modems, other computers, or any other peripheral device requiring a 'Centronics' type parallel or RS-232 serial interface.

Until now the only way to get hold of this product was to import one directly yourself, although Silica Shop did advertise it a while back. I've just heard that Frontier Software have become the UK distributor for ICD products, and can supply the P:R:Connection (PRC) along with many other interesting ICD 8-bit accessories. The review model came in via the import route, and this gave rise to a disastrous problem I'll describe later.

The package as supplied includes the interface box itself, a detailed instruction manual, and a double sided disk containing mainly communications software. No device cables are provided – you have to supply these yourself.

ICD intend the PRC to be a straight replacement for the expensive and elusive Atari 850 interface. It's virtually 100% compatible, including use of the 850 cables. In the few instances where there are compatibility issues, these may be fixed by using a supplied 'translator' program.

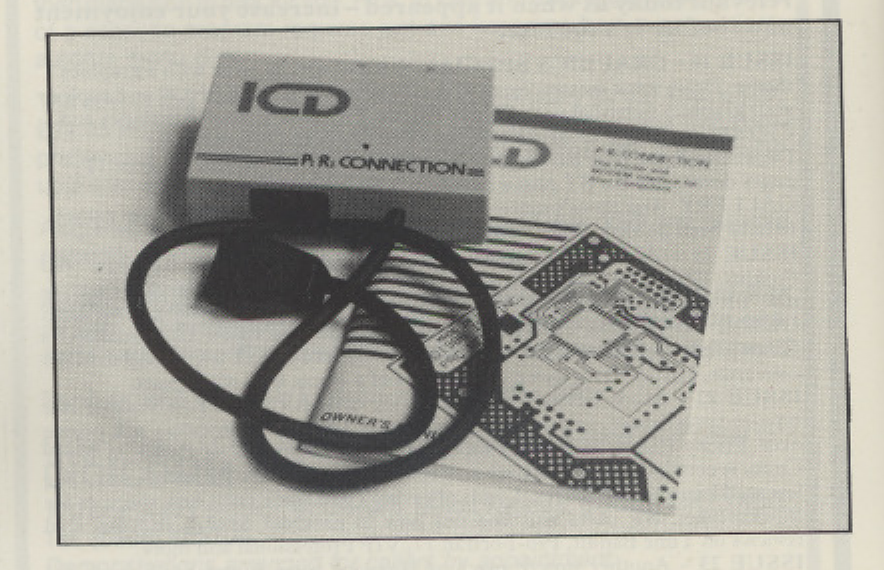
CABLE COSTS

Finding suitable, reasonably priced device cables was a problem. I had several quotes for 850 cables at around £20 and over (EACH!), which I think is appalling. How can companies justify charging such horrendous prices for cables? ICD sell them for half this in the USA, so why can't UK companies manage something similar? Frontier Software could generate a lot of goodwill (with me, at least!) if they sold ICD cables too. *(Frontier are now handling these cables at a reasonable price. Ed.)* I eventually found some at a more acceptable price at York Computer Centre.

A SMALL PLASTIC BOX

The PRC itself is a small plastic box measuring about 5″ × 3.5″ × 1″ with a standard Atari serial bus cable emerging from one side. This plugs into the Atari's serial socket, and you then plug the rest of your I/O daisy chain into the serial bus socket on the PRC. There's no separate power supply needed (yippee!) as the PRC draws its power directly from the computer via the serial bus connection. It works fine unless you happen to own a 1200XL. This needs a simple hardware modification for which instructions are provided.

On the opposite side of the case are the I/O ports – one parallel and two serial. "P1:" is the 'Centronics' parallel printer port, using a DB15 socket. "R1:" and "R2:" are both



The Right Connection?

RS-232 serial ports, using DB9 sockets. The former is a full serial port containing all the handshaking lines required by certain modems, while the latter is a cut down version handling only receive and transmit lines. The old Atari 850 interface had two additional ports, one of which provided the rarely used 'current loop' facility. They were omitted from the PRC in order to keep down costs.

Inside the grey case is a very neat circuit board containing a number of discrete components and several IC chips. One of these is a complete microprocessor in its own right, containing ROM, RAM, PIA, and a CPU! The board also contains two jumper switches. One can be set to provide auto-linefeeds for your printer – useful if you swap the printer between 8-bit and ST machines, as it removes the need to fiddle with those annoying printer DIP switches. The other switch allows you to turn the printer function off, again useful if you're already using a directly connected Atari printer.

EARLY MODEL PROBLEMS

My first test involved replacing the trusty Blackthorn interface I use to drive my Star SG10 printer. It took just a few moments to connect up the PRC in its place and to try a few quick LPRINT commands from BASIC. Result – Error 143. Hmmm, not so good. I rechecked all cable connections and retried it. Same result. I tried to LIST a BASIC program instead. No good. I tried to print a document with Atariwriter Plus. Still nothing. No amount of experimentation would induce it to print. Disaster!

At the time I wasn't aware that Frontier Software were about to start handling ICD products, so I contacted Silica Shop who kindly offered to help me sort out the problem. I took the PRC and cables down to them and we tried substituting different cables, computers, and their last

John S Davison tests a replacement for the 850 interface from Frontier Software at £69.95

remaining PRC. Surprisingly, even this didn't work. (Thanks anyway, fellas!)

Baffled and disappointed, I went home and wrote to ICD in the USA. A few days later I received a phone call from ICD president Tom Harker, who explained that the first few thousand PRC's made were incompatible with PAL system 8-bit machines (i.e. those used in the UK). The design was subsequently modified to fix this, so my PRC (and Silica's?) must have been an early model. The solution was to replace the 4 MHz crystal on the PRC's board with one of 3.9 MHz. I received a replacement crystal from him by airmail shortly after, and fitting this caused the PRC to drive my printer exactly as the Blackthorn had. Moral – if you import your own hardware from the USA make sure you know what you're getting!

SOFTWARE REQUIREMENTS

When used to drive a parallel printer no additional software is required – simply plug in the PRC and go. Using the RS-232 interface is rather more complex, needing some form of driving software. This is where the ICD supplied disk comes in, as it contains a number of useful programs.

There are three (yes, three) different communications programs provided. All are public domain programs and widely used in the USA. The first is AMODEM 7.2, considered by ICD to be one of the best communications programs available for the 8-bit machines. Then there's my favourite – 850 Express, a modified version of 1030 Express, which is immensely popular in the USA. Just looking at it I can see why – it's got some superb features! Finally, there's RSCOPE, needed only if you're rich enough to afford to access and download programs from the USA's CompuServe system.

There's no separate documentation provided for this software – it's all on the disk, so you can either print it out or view it directly on the screen via a text editor.

I haven't had a chance to try out the communications side of the PRC and its software yet, so I'll defer comment on it until the next issue. Watch this space for details.

ICD's P:R:Connection is great news for 8-bit users. At last you can be freed from the straightjacket of Atari specific printers and choose virtually any one that takes your fancy (modems too!). Considering you also get a diskful of useful software it's superb value for money. If you need a good, comprehensive interface device for your 8-bit machine, then look no further. Get ICD's P:R:Connection.

UPDATE

MJDBASE (ISSUE 29): Reader Eric Chapman has suggested the following amendment to this program. As new records are entered, the index is re-sorted on each entry which means that the program slows considerably when there are several hundred records. The following changes will mean that the index is only re-sorted when you exit New Record mode. Change the following lines:

10300 RECS = RECS + 1:CHANGE = 1
10600 – Replace the RETURN at the end with GOTO 29200

DESIGNER LABELS (ISSUE 26): The article states Epson Compatible Printer required but what wasn't clear at the time was that whilst it would run on an Epson 'compatible' it doesn't actually run on an Epson! Quite a few lines need to be changed as follows

```
FM 5410 TEMP$="  [graphic]":MID$="[graphic]":MID$(2)=CHR$
    (130):EN$="[graphic]":GOSUB SIZE:PTOP$=TEMP$
MR 5420 TEMP$="  [graphic]":MID$="[graphic]":EN$="[graphic]":GO
    SUB SIZE:PRIN$=TEMP$
SY 5430 TEMP$="  [graphic]":MID$="[graphic]":EN$="[graphic]":GO
    SUB SIZE:PBOT$=TEMP$
RF 8110 ? #2;ESC$;"1";CHR$(10)
VI 8120 ? #2;ESC$;"R";CHR$(10):? #2;ESC$;
    "U";CHR$(1)
YM 8130 ? #2;ESC$;"A";CHR$(8)
DE 8140 ? #2;PHEAD$:? #2;PTOP$
GB 8150 FOR NUM=1 TO DEP:? #2;NUM;:IF NUM
    <10 THEN ? #2;" ";
WR 8160 FOR N=1 TO GWID
QH 8170 BYTE=PEEK(SCR+N):IF BYTE=124 THEN
     BYTE=134:REM DOES | (CTRL =)
HF 8180 IF BYTE=84 THEN BYTE=140
LB 8183 IF BYTE=0 THEN BYTE=32:GOTO 8210
XE 8185 IF BYTE>31 AND BYTE<59 THEN BYTE=
    BYTE+32:GOTO 8210
QY 8190 REM IF BYTE<96 THEN BYTE=BYTE+32
BK 8200 IF MODE=1 AND BYTE>32 AND BYTE<12
    8 THEN BYTE=32
EJ 8210 ? #2;CHR$(BYTE);:NEXT N:SCR=SCR+4
    0:? #2;CHR$(155);
CL 8220 IF NUM=DEP THEN ? #2;PBOT$
F5 8230 IF NUM<DEP THEN ? #2;PRIN$
HI 8240 NEXT NUM
RU 8250 CLOSE #2:POKE 559,P559
```

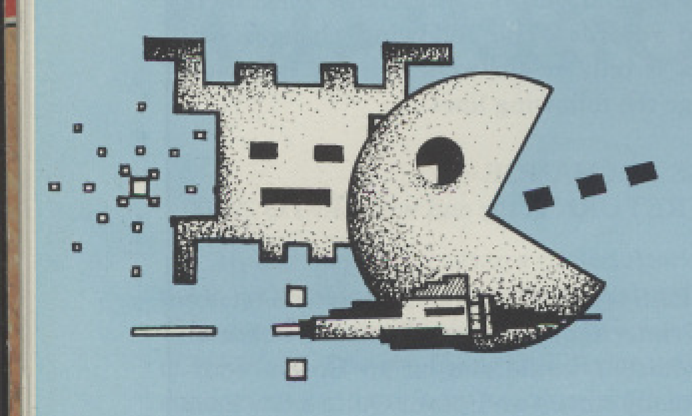
You may also need to change one of the dip switches in the printer to activate the Graphics character set. Unfortunately, different models have different settings so you will have to refer to your manual.

COMING SOON ...

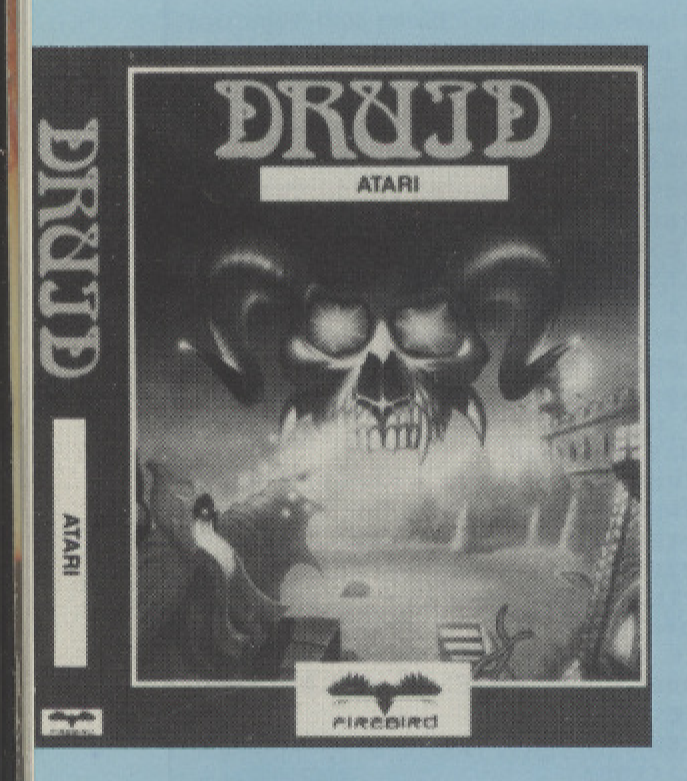
WARGAMES ... A massive review, all you need to know

EXPANDING YOUR ATARI ... all the juicy details about those I/O and expansion ports and what to do with them

SOFTWARE REVIEWS



Paul Rixon gets through a lot of games!



DRUID

Firebird
Cassette £9.95
Disk £14.95
1-2 players
1-2 joysticks

Gauntlet clones seem to be all the rage lately and DRUID is clearly Firebird's attempt to cash in on the trend. I'm not complaining though – this one's a real cracker! I'll briefly run through the plot first, and leave the superlatives until later.

Peace and well-being are in jeopardy throughout the lands of Belorn due to the likes of four demon Princes of Darkness, who have appeared through an inter-dimensional gateway in the dungeons of the evil Acamantor. As last of the Great Druids it's your duty to destroy the four skulls of the Princes which can only be found in the dingiest depths of the dungeons. Eight types of magical spell are at your disposal. Fire, water and electricity spells may be used in defence against the constant onslaught of hell-spawned 'dimension monsters' and other evil-weevils intent on your disappearance.

Several other spells are available for unlocking doors, for giving you limited powers of invisibility and for creating a 'Golum'. A Golum is a yeti type character who kills all adversaries on contact. He can be programmed to automatically wait, follow or lead you around the dungeons or a second player can intervene via a second joystick – clever stuff! A 'chaos' spell acts to eliminate the skulls once you've found them, and can also be used to escape from tight spots in the game. You only possess a limited number of powers to begin with, extra abilities may be obtained from chests, and here a degree of skill is required to select the most profitable item. Nicely animated 'pentagrams' replenish your energy reserves. Very useful these!

There are one or two further surprises awaiting you in the dungeons but I'll leave them for you to discover. At the end, a rating system labels you with one of sixteen titles ranging from 'Halfwit' to 'Lightmaster'. I'm not going to tell you what it called ME though! You'll have gathered by now that DRUID is not one of those simplistic 'thrown together in five minutes' jobs. A lot of thought and programming skill has obviously gone into the game.

DRUID excels in the graphics department. Bi-directional stairways give access to eight levels of dungeon, each offering a different blend of hi-res multicoloured scenery and ground features. Information relating to the number and nature of remaining spells is displayed in the top half of the screen together with an indication of your energy level. Scrolling is excellent, as it should be on the Atari, and although there isn't any music, sound effects are plentiful.

This is truly an enthralling product and one that Firebird should be proud of. It's more involved than Phantom and streets ahead of the awful Gauntlet. No price accompanied the review copy although I get the impression that it is not intended as a budget release. Even so it should definitely be at the top of every arcade gamer's shopping list. ●

180

Mastertronic
Cassette
£2.99
1-2 players
1-2 joysticks



Simulations remain as popular as ever and I'm sure this new one from Mastertronic will be gratefully received by a good many armchair sportspersons. '180', as I expect you've already guessed, is a darts simulation similar to the Thorn EMI game released a few years back.

A large hi-res dartboard fills up most of the screen with a blackboard to one side on which the scores are chalked up. There's also a quivering hand holding the dart – good graphics but don't darts players have arms too? Control of the hand is via the joystick diagonals and to make things even more difficult it can't be stopped at any particular point, i.e. to remain in one place requires constant jiggling of the stick. The idea is to line up the dart, not as easy as it sounds, and press the trigger to throw it.

In practice mode you have to hit each number in sequence, from twenty down to one, in a limited time. The main game is standard matchplay darts, that's where the winner is he or she who scores 501 points first, not forgetting to finish

UNIVERSAL HERO

Mastertronic
Cassette
£1.99
1 player
1 joystick

An arcade adventure with 'Dropzone' graphics and the challenging perplexities of 'Spellbound'. Could this be the ultimate budget release? No, but it certainly could have been if S.A. Riding had remembered to include some sound and Mastertronic had provided some sensible instructions.

From what I was able to ascertain from the (inadequate) information supplied on the cassette inlay, the plot is that an incapacitated space freighter is out of control and it's up to the Universal Hero, alias you, to find the parts necessary to mend it and thus save mankind. Trouble is, the freighter's on another planet and the only way to reach it is by shuttle. By some incredible coincidence the shuttle is also in disrepair so you've got to locate the bits to fix it before going any further. What's more there's a time limit before the freighter hits the planet and the Hero has a restricted amount of Oxygen. Phew!

Brilliant is a very apt description of the graphics. The Universal Hero is himself a superbly drawn little chap with



space helmet and jet-pack, used for propulsion around a vast maze of caves and planetary landscape, which is very reminiscent of the 'Dropzone' graphics in design and colouring. 'Useful' artifacts are waiting to be found at some of the locations, and these may be taken, dropped or examined by means of a keyboard input. The Hero has a nine object carrying capacity and all articles he has obtained are displayed in a box above the main play area. Surprisingly there is absolutely no sound whatsoever during normal gameplay. A beep signifies when an object has been taken or dropped and a series of beeps are heard if you touch something you shouldn't. Other than that, it's golden silence throughout.

At this stage I ought to be telling you about the puzzles the Hero encounters on his travels, but I'm afraid I've got to admit that the game has me temporarily baffled. Despite obtaining eight objects and exploring all of the immediately accessible screens I have come to a complete standstill. There's a pile of rocks blocking one entrance, and I've got dynamite and a plunger, but how do I use them? Your help would be appreciated!! The instructions are completely abysmal. They don't even mention that starting the game requires pressing 'S' on the keyboard – an inexcusable oversight.

All in all, UNIVERSAL HERO is a very good game that could have been truly unbeatable if a little more thought had gone into the finishing touches. It's a shame that Mastertronic have come so close to creating a classic and then blown it at the last minute. Maybe they'll do it next time? •

on a double. You join the game at the quarter final stage of a championship knockout tournament, and to win you've got to beat three opponents supplied by the computer. These are chosen at random from a team of seven dubious characters with names such as 'Belly Bill' and 'Limp Wrist Larry'. It's the best of three sets to decide a winner, and if you are successful you'll go on to challenge the world champion 'Jammy Jim'. He seldom throws a dud shot!

When it's the computer's turn, an animated sequence shows the opponent making his throw with a background of pub-scape sadly lacking in detail and colour. At least the music is quite good and the interlude doesn't last for too long! Keep your ears open for a short burst of digitized speech if you manage to score the infamous three double twenties in a row (hence the title).

If mathematics isn't one of your strong points Mastertronic have kindly included a chart of winning combinations, but don't take them for gospel – one or two errors have crept into the text! A final quibble concerns the difficulty level which appears to be on the easy side. I consistently beat Jammy Jim in the final and was awarded a suitable rating such as 'mega-cool', however since there is a two player option the game would seem to offer lasting appeal.

In the words of Jim 'Bullseye' Bowen – 'Terrific, super, how about a round of applause?' •

INVASION

Mastertronic
Cassette
£1.99
1 player
1 joystick/ keyboard

Tactical war simulations are enjoyed by a small but growing number of dedicated followers who rejoice over titles such as 'Tigers in the snow' and 'War in Russia'. Exorbitant American price tags have prohibited their widespread popularity in the past, but Mastertronic have now enabled a much wider audience to scrutinize the wargame concept with the release of INVASION, set on a planet inhabited by alien beings whose plan is to invade Britain. Can you prevent them from going ahead?

You have sole responsibility for Britain's defences, commanding several military outfits including 'radar' and 'explosive' units. Destroying a weather station is your main objective, and this is accomplished by situating three explosive units in adjacent positions next to the station. Alien units counter your every move so constant monitoring of all developments is necessary to establish what is happening. Instructions are issued to the units by means of a cursor, and the computer automatically handles the move and determines the outcome of combat.

Damage to a unit may be partially repaired by utilizing fuel cells, and a 'teleprinter' provides updates of the current situation. Status reports can be optionally displayed and other facilities include game save, 'explode unit' and 'move cursor to next stationary unit'. Points are awarded for disabling the weather station and alien ships, with bonus points given for eliminated alien units and human units remaining intact.

Graphically INVASION is a bit of a let down. The battle area is pretty drab and uninspiring, scrolling is not at all like the smooth and effortless movement to be found in 'Eastern Front' but extremely jerky, and the display is generally lacking in detail and professionalism.

It's worth checking out if you are prepared to put some effort into gameplay. War simulations are by no means light entertainment and anyone buying the game without prior knowledge of the format could be in for a disappointment. Seasoned war tacticians should find it a worthwhile challenge. •

SURVIVORS



Atlantis Software
Cassette
£2.99
1 player
1 joystick/ keyboard

It's the year 2087 and the world has been completely devastated by a nuclear war. Presumably you've managed to get 'The Last V8' back to Sci-base and now it's time to think about rescuing the survivors of the war, who are trapped inside a damaged hibernation dome. You have enrolled the expertise of three specialist Droids to search the seven levels of the dome and retrieve the 135 missing persons.

Damage to the building has caused numerous boulders to dislodge and block many of the pathways, so a knowledge of boulder-physics would be rather useful. Yes folks, it's Boulderdash revisited!! Some of the rocks landed on top of 'MK.1 Guardian Droids' who had been maintaining the life support systems, transforming them into hostile monsters. Keep an eye open for these!

Each Droid under your control has a specific function and you must utilize these talents to succeed. The first is used for tunnelling, the second for rescuing the survivors and the third for shifting boulders. Rockford could teach this lot a thing or two! Switching between Droids by keyboard input is frequently necessary during play and this tends to become tedious after a while.

The playfield is based upon a graphics mode one screen, so there are only three colours available – the default hues have been used – and the display is generally very blocky, although at least everything is very big, bold and conspicuous. Scrolling is the biggest failing of the game. The screen jerks over an inch at a time, which is extremely irritating to the point where it detracts from gameplay. It's not so bad if you move at a snail's pace, but then the timer runs down before you've had a chance to complete the task. Hisses and beeps are all you're likely to hear in the way of sound effects.

SURVIVORS isn't a bad game at the budget price, but it's not one I would instantly recommend. As for that scrolling....!!

MILK RACE



Mastertronic
Cassette £1.99
1 player
1 joystick

Every year cycling professionals from all around the world participate in an increasingly popular event – The Milk Race – which this year was held over a thousand mile course beginning in Newcastle-Upon-Tyne and winding its way around the country to a finishing line in London. Mastertronic's MILK RACE puts you in the saddle of a twelve speed racer competing against eighty-three other hopefuls in a simulation of this year's event.

The game is split into the thirteen stages of the real Milk Race, and you must maintain pole position over each of these sections to win the event overall. It's more of a strategic exercise than a race in fact, the idea is to change gear and adjust your pedalling rate in order to attain the most efficient use of your energy reserves. A gradient indicator provides some insight into the required gear, but otherwise it's basically a matter of trial and error to discover which gear/speed setting best stems your energy depletion rate.

Additional energy is obtained by collecting bottles of nice old, ice cold milk from the roadside. Time trials are sprung upon you at random points along the route and in these you have to complete the section within an allotted time or face elimination. Potholes are commonplace in Britain's road network and hitting one of these incurs an annoying delay. There seems to be a slight bug here in that occasionally, if you've crashed, any cyclists passing the mangled heap actually improve your overall position rather than the opposite.

Graphically, the game is well designed with nicely animated cyclists and a horizontally scrolling road, your view being raised above ground level so that sideways movement of the cyclists and detail in the road can be easily detected. Background scenery scrolls by at a different rate as do the heads of onlookers – not all of them human! Passing team cars add to the realism, and original music is included although this can be silenced if need be.

MILK RACE is one of Mastertronic's better efforts, and it's a worthy addition to the budget range. Keep 'em coming please Mastertronic! ●

BOULDERDASH II

Prism Leisure Corp.
Cassette £2.99
Disk £4.99
1-2 players
1-2 joysticks/ keyboard

BOULDERDASH has had a long and interesting lifetime. Originally published by First Star Software three years ago, it became an instant smash hit on the Atari and on the lesser micros too. Mirrorsoft brought the game officially into the UK about a year later, again with widespread popularity, and shortly afterwards Databyte announced the UK release of its successor BOULDERDASH II – 'Rockford's Revenge'. Prism Leisure Corp. are now re-releasing the BOULDERDASH duo and the good news is they can be yours for under three pounds a piece.

Following a superbly designed and animated title page with musical accompaniment the game proper gets underway. You control the relentless Rockford, a cute little dude whose only aim in life is to collect as many diamonds from the caves as he possibly can. It sounds a doddle until you experience the eponymous boulders which tend to crush poor Rockford if he doesn't move out of the way in time.

Blocking amoebas, transforming butterflies and out-manoeuvring fireflies are just a few of the distractions Rockford will encounter on his travels. A quick reaction is not the prime necessity – each cave is a complex and challenging puzzle requiring skill and brain-power to complete it. There's not a lot of people who can claim to have finished all sixteen caves in series without cheating! Full playing strategies are thankfully provided on the inlay.

If you do manage to master the first level there are four more to contend with after that. BOULDERDASH is not a game that you're going to tire of in a hurry. There are some great sonics included, and visually the game is superb. Just wait until you see Rockford impatiently tapping his foot during pause mode!

The majority of Atarians will already have the BOULDERDASH duo in their collections, but if it's missing from yours then you ought to make amends as soon as possible. My special thanks go to Rockford for sending me a pack of his edible boulders with the review copy. Yummy! ●

DECATHLON

Firebird
Cassette
£1.99
1-4 players
1-2 joysticks

What's this?, An exciting new athletics simulation? No, actually it's a re-release of the Activision DECATHLON, the game originally published during 1984 on ROM cartridge. At that time you could expect to pay anything over £20 for the game, which illustrates how greatly the software companies' strategies have (wisely) altered over the past few years.

Anyway, this version of DECATHLON is entirely identical to the original (apart from the 'budget' packaging) and will enable you to participate in a full-blown athletics meeting, competing with up to three friends (or enemies!) if you wish, or alternatively you may opt to practice any of the individual events – 100, 400 and 1500 metre races, Long Jump, High Jump, Shot Putt, Discus, Javelin, Pole Vault and 110 metre Hurdles.

Every event, without exception, involves the much dreaded process of joystick waggling, or joystick destroying as it is otherwise known. Better take into account the cost of a new one before you buy the game! The trigger is used to jump and throw in the appropriate events, and to place the pole in the vault pit when necessary. Success will depend on your stamina and dexterity as you waggle the stick from side to side at, hopefully, death-defying speed. Hitting the trigger at precisely the correct instance is advisable too! Triumph is awarded by a suitable points allocation – score over 1000 points and a fanfare is sounded to celebrate your achievement!

If you select a single player game the program displays a pace-man in the running events, who generally livens up the situation and creates the impression that you really are in a race. Clearly you can only hope to improve on your previous high-score, so it's much more of an entertainment if you can find some human opposition to intensify the competition.

Animation in this type of game often tends to be something of a disappointment, but the movement of the athletes and their shadows in DECATHLON is excellent, complimented by scrolling that is well up to the Atari's high standards, and an impressive side-on view of the stadium and onlooking crowd. Sound effects aren't quite so hot but they're perfectly adequate given the nature of the game.

Try and snap this one up if you haven't already done so. Firebird really are offering good quality software at a sensible price. •

FRENESIS

Mastertronic
Cassette
£1.99
1 player
1 joystick



If there's an award going for worst Atari 8-bit game of 1987, FRENESIS is certain to clinch the title – no sweat! Graphics are diabolical, sound isn't up to much either and as for the game itself...

The screen view is largely blank, apart from so-called aliens disguised as blobs appearing from the perimeter of the playfield and closing in towards a large cross. Your task is to prevent them from ever reaching their destinations by careful manipulation of a tooth edged line called a Straton. Vertical or horizontal movement of the Straton is achieved by an appropriate push on the joystick, and if an alien is hit by the toothed edge of the Straton it disappears. Selected aliens require multiple zapping and 'Mega annihilating smart bombs' are also available, if you can be bothered to use them.

That's all there is to it. Forty levels of utter boredom – hardly a frenetic experience by any twist of the imagination! FRENESIS was 'programmed' by Tony Takoushi, well known arcade games fanatic to readers of a certain computer publication. If this is his idea of a joke then I'm definitely not amused! If it's not, I would respectfully advise him to practice his talents on the Oric Atmos or unexpanded Vic 20.

Without a shadow of doubt it's Mastertronic's most unappealing release to date, and a step in the wrong direction for the budget pioneers. Highly unrecommended! •

GAUNTLET THE DEEPER DUNGEONS

U.S. Gold
£4.99 cassette
£6.99 disk
Requires GAUNTLET

Attention all GAUNTLET fanatics! Having rushed out to buy the current U.S. Gold top seller, perhaps after reading the review in PAGE 6 (!), you might have survived the dangers imposed by demons, ghosts and similar obnoxious nasties, and be seeking a further challenge. If that is the case, THE DEEPER DUNGEONS are for you.

What you get are 512 brand new previously unexplored mazes, bubbling to the brim with all manner of adversaries, treasures, doors, rations (beware of the poisonous ones!) and generally the kinds of things that you would expect to find on any Sunday afternoon stroll into a deep dungeon. If you were an entrant to the design-a-screen competition then you may even see your name printed on the inlay card! Adhering to all of the rules established in GAUNTLET you will be given the opportunity to control the hero of your choice around the dungeons collecting treasure, searching for exits and, of course, killing anything that moves.

The genuine GAUNTLET arcade machine features stereo sound (courtesy of the POKEY sound chip!), voice synthesis and superb graphics. Nobody was expecting anything quite so mind-blowing on a home micro, but the truth of the matter is that following months of speculation and rumour, the Atari 8-bit version is a huge anti-climax. It is completely boring, visually very forgettable – apart from a glimmer of hope resting in the ace title page – and sonics are virtually nonexistent.

Needless to say, any comments made by Paul Blazeby in issue 28 hold true in this review. THE DEEPER DUNGEONS are simply more of the same – quite a lot more in fact. Take my advice, invest your hard-earned cash in Firebird's DRUID instead. It's infinitely more playable! Don't forget that you must already own GAUNTLET before you can run THE DEEPER DUNGEONS, and also that the cassette and disk versions cannot be intermingled. Not a lot more I can add except buy it at your own peril! •

READING AND SAVING SCREENS

Welcome back to First Steps. After last issue's break from the trials and tribulations of programming your Atari, it's time to get back to some programming. You'll never learn if we keep chatting about other things!

In previous issues I have covered several graphics topics and by now you should have had ample time to try your hand at the graphic modes and maybe have even tried a little bit of animation. Your program will draw a picture with its own routines (PLOT, DRAWTO), but quite often you may wish to save the picture for use elsewhere, or perhaps you wish to keep the same program routines and load in different backgrounds. So how is it done?

SLOW BUT SURE

First we need to find out what is on the screen. If we were to set up a GRAPHICS 0 screen with some text on it, we could look at every point on the screen (GRAPHICS 0, 24 lines and 40 columns = 960 points) and obtain the ASCII value of the character using LOCATE. For example,

LOCATE X,Y,Z (The same as POSITION X,Y: GET #1,Z)

LOCATE sets the cursor at position X,Y (defined by the program) and reads the value of the character or point under the cursor. In text modes this will obtain a value for Z ranging from 0 to 255, depending on the character under the cursor. The same technique can be utilised for the graphics modes except that here the value will be 0 or 1 for the two colour modes, and 0 to 3 for the four colour modes. These colours correspond directly to the COLOR register used. Except when using the default colours, the SETCOLOR registers must be stored as well.

LISTING 1 shows how to read the screen, store the details and how to set up the screen after it has been cleared. The program itself is pretty simple and I hope that Steven Wayne agrees that the REM's will be explanation enough. The value (Z) under the cursor is changed to the ASCII value and stored in a string. This makes it easy to print the character directly from the string using a POSITION statement.

```
SJ 7 REM *** Choose Graphics 0 screen.
RI 8 REM *** Hide cursor with POKE.
DR 9 REM *** Dimension string to screen
             resolution. Set counter.
QR 10 GRAPHICS 0:POKE 752,1:DIM B$(40*24)
   :A=1
TL 19 REM *** Set up your own screen here
              or just continue.
JE 90 LIST 7,130
JQ 99 REM *** Set up for column and row.
YN 100 FOR COL=0 TO 23:FOR ROW=0 TO 39
EP 109 REM *** Read screen point.
LB 110 LOCATE ROW,COL,POINT
TJ 118 REM *** Change POINT value to
               ASCII value and save to
               string.
YH 119 REM *** Reset counter for the next
               string location.
SS 120 B$(A,A)=CHR$(POINT):A=A+1
OA 129 REM *** Continue.
CC 130 NEXT ROW:NEXT COL
FP 139 REM *** Clear screen and replace
               everything to screen.
SY 140 GRAPHICS 0:POKE 752,1:A=1
TW 149 REM *** Set up for column and row.
YX 150 FOR COL=0 TO 23:FOR ROW=0 TO 39
FQ 159 REM *** Read string and print to
               screen.
FP 160 POSITION ROW,COL:? B$(A,A);:A=A+1
OI 169 REM *** Continue.
CK 170 NEXT ROW:NEXT COL
IO 180 ? "ALL DONE! - PRESS BREAK."
PT 190 GOTO 190
```

Listing 1

A FASTER WAY

The previous technique is slow, but even slower when it comes to the higher resolution modes. A better way would be to use screen memory. Each point on the screen has its origin in RAM. Stored in these locations are the details of the points i.e. colour or character. The position of the start of screen RAM is stored in locations 88 and 89 (termed pointers). To find out where exactly this is in your own computer enter the following and press RETURN,

PRINT PEEK(88)+256*PEEK(89)

The number given is the memory location that stores the value of the top left hand corner of the screen. Each point on the screen is stored sequentially in memory from that memory location.

So why use a pointer? Well, when different modes are used the RAM is increased or decreased according to the amount needed for that mode. The computer will shift the start of screen RAM to compensate for this and as it varies so much, you need to store the start of screen RAM somewhere so that you can keep track of where the screen starts. The technique of pointers is used quite a lot in the ATARI architecture.

Location 88 is equivalent to the *units* in decimal counting and location 89 can be compared to the *tens*. For instance, 21 in decimal is 1+(10*2), so location 88 would store the 1 (units) and location 89 would store the 2 (tens). In the case of computers though groups of 256 are used instead of 10's, so a 1 in location 88 and a 2 in location 89 would equal 513. The reason for the magic figure of 256 is simple. The memory chips have eight read/write lines and each line has two states – either ON or OFF (just like a light switch). With two states and any combination of eight lines the mathematicians amongst the readers will deduce that you will have two to the power of eight possibilities – 256!

Directly reading the screen RAM means that we can do

Mark Hutchinson shows you how in his regular column for beginners

away with LOCATE and speed up the program. This can be demonstrated by listing 2. This program is slightly faster due to the reduced amount of program commands, but it is still very slow.

NOW HOW TO SAVE IT

So now that we have read our screen, where and how can we store it?

Storage in memory can be in two forms, either as a string or as a variable, both are temporary. The string can be held until filled then transmitted to disk or tape all at once but the variable must be transmitted at once otherwise the FOR/NEXT loop will overwrite it on the next pass.

Using PUT/GET commands with a variable, the data has to be passed to disk or tape one byte at a time. This may seem to be slow but it allows the use of a device called the Input Output Control Block (IOCB). This block is the socket you plug the tape or drive into. It is controlled by certain locations in memory and, if these locations are POKEd correctly then some great things can be achieved.

When you connect the tape or disk lead into the input/output socket of your computer you have given yourself a choice of eight communication channels, 0 – 7 (remember OPEN #1, etc?). Each channel has sixteen bytes of memory reserved for it in RAM, from locations 832 to 959. You will be told by various handbooks that you can use them all for your own use, all except channel 0 that is, because it is reserved for the screen display. This is not true, you can use the screen display, and to prove it I will introduce you to the ATARI 'Forced Read Mode'. I must confess though, this has been mentioned before in PAGE 6 by myself and others, but can you have enough of a good thing?

In this mode the program will stop running (the STOP command) and place information on the screen (using PRINT). Then it will reposition the cursor above the new program lines and enter the lines, directly from the screen, as if you had pressed RETURN. The CONT command will start the program where it left off, any new lines being run. LIST will show the modified program.

A self-modifying ATARI! LISTING 3 will demonstrate this effect.

That's it for this issue. Next time we'll take a closer look at those IOCB's. Meanwhile, don't forget that you can write with your problems or to suggest further topics for the column. **Write to MARK HUTCHINSON, 1, HOLLYMOUNT, ERINVALE, FINAGHY, BELFAST, BT10 0GL**

```
GA 9 REM *** Set up screen, put something
             on it. Remove cursor. Set up
             string.
VN 10 GRAPHICS 0:POKE 752,1:DIM B$(1000):
   LIST 9,100
SG 19 REM *** Get location of top left
              corner.
LQ 20 P=PEEK(88)+256*PEEK(89)
EZ 29 REM *** Place value of location as
              a character in the string.
RJ 30 FOR A=1 TO 960
ON 40 B$(A,A)=CHR$(PEEK(P+A-1))
FZ 50 NEXT A
GM 59 REM *** Clear screen and replace
              everything to screen.
BO 60 GRAPHICS 0:POKE 752,1
VN 69 REM *** Retrieve the data and place
              in screen memory.
LV 70 GRAPHICS 0
RO 80 FOR A=1 TO 960
YE 90 POKE P+A-1,ASC(B$(A,A))
CP 100 NEXT A
```

Listing 2

```
YJ 10 GRAPHICS 0:POKE 842,13
SC 20 POSITION 2,13:? "8":? "9":? "19":?
   "29":? "39":? "49":? "59":? "69"
MF 30 ? "100 SE.2,2,2"
TD 40 ? "CONT"
BU 50 POSITION 0,0:STOP
GZ 60 POKE 842,12
ZA 70 LIST
RM 100 SETCOLOR 2,2,2
```

Listing 3

THE FIRST STEPS COMPUTER DICTIONARY continued

Chip – A piece of semiconductor material containing a microscopic integrated circuit.
Integrated circuit – A tiny circuit in which the electrical components are made of chemical elements diffused into a piece of semiconductive material.
Character – a single letter, number or symbol.
Daisy wheel – A plastic disk with spokes used as the print mechanism in letter quality printers.
Data – information to be processed by a computer.
Database – The entire collection of information available to a computer. A structured collection of information, or a collection of related files, considered as an entity.
Data set – A modem. A collection of data records with a logical relation to one another.
Device Handler – A collection of routines that connect the operating system and the user program with the input/output devices. There is one handler for each type of peripheral device in the hardware configuration.
Direct Memory Access – Transfer of data between a peripheral and main memory without intervention of the CPU.

More definitions next issue!

THE RESOURCE FILE

The Resource File is a new service provided by PAGE 6 to help Atari owners (both 8-bit and ST) find sources of information, help and supply. An entry in this feature does not necessarily imply any endorsement by PAGE 6 and readers are advised to check for themselves to ensure that the information is still current. We would ask any readers who find information to be inaccurate or out of date to let us know so that an entry may be amended or deleted.

RETAILERS

The following retailers, to the best of our knowledge, support Atari 8-bit or ST and sell PAGE 6.

ATARI WORLD
15, Fennell Street
Manchester
M4 3DU
Tel. 061 834 4941

BRIGHTON COMPUTER EXCHANGE
2, Ann Street
Brighton
BN1 4GP
Tel. 0273 686650

CHIPS
53, Rugby Road
Worthing
Sussex BN11 5NB

COMPUTER CENTRE
174, High Street
Hornchurch
Essex
Tel. 04024 75613

COMPUTER WORLD
212, Broad Street
Birmingham
B15 2AY
Tel. 021 643 9100

GAMER
71 East Street
Brighton
Sussex BN1 1HQ
Tel. 0273 728681

GLASGOW COMPUTER CENTRE
Virginia Galleries
33 Virginia Street
Glasgow
G1 1TU
Tel. 041 552 1522

GUERNSEY COMPUTERS LTD.
33, Commercial Arcade
St. Peter Port
Guernsey
Channel Islands
Tel. 0481 28738

HI-FI WESTERN LTD.
52, Cambrian Road
Newport
Gwent
Tel. 0633 62790

INTOTO
1, Heathcoat Street
Hockley
Notts. NG1 3AF
Tel. 0602 410987

JENNINGS STORES
244 – 248, Hertford Road
Enfield
Middx
Tel. 01 804 1767

LADBROKE COMPUTING LTD.
33, Ormskirk Road
Preston
Lancs. PR1 2QP
Tel. 0772 21474

LIVINGSTON COMPUTER CENTRE
17, The Mall
Craigshill Shopping Centre
Livingston
West Lothian
Tel. 0506 36978

MICROBYTE
Maghull Business Centre,
Red Lion Buildings,
Liverpool Road North,
Maghull,
Merseyside L31 2HB
Tel. 051 526 5256

MICRO-TRONICS
27a, Market Street
Tamworth
Staffs
Tel. 0827 51480

P.F.MURPHY & SONS LTD.
Cross Lanes
Drogheda
Co. Louth
Ireland
Tel. 041 37292

ONE STEP BEYOND LTD.
11a, Castle Meadow
Norwich
NR1 3DG
Tel. 0603 663796

ORDEM
21, Harris Arcade
Reading
Berks. RG1 1DN
Tel. 0734 474768

PEATS ELECTRONICS
197, Parnell Street
Dublin 1
Ireland
Tel. 0001 727799

RADFORD HI-FI LTD.
52, Gloucester Road
Bristol
Avon
Tel. 0272 428247

SILICON CENTRE
7, Antigua Street
Edinburgh
Scotland
Tel. 031 557 4546

SOFTWARE EXPRESS
514 – 516, Alum Rock Road
Alum Rock
Birmingham B8
Tel. 021 328 3585

A.S. WOOTTON & SON
116, Edleston Road
Crewe
CW2 7HD
Tel. 0270 214118

YORK COMPUTER CENTRE
9, Davygate Arcade
Davygate
York YO1 2SU
Tel. 0904 641862

The only criterion for an entry in this column is that the retailer must stock PAGE 6. That is the only measure we have that a retailer is genuinely interested in supporting Atari. Phone us on 0785 213928 if you wish to be included.

BBS

Name: Gamlingay FIDO
Number: 0767 50511
Hours: 24 hours
Baud: 300 – 2400
Features: Atari SIG and program library

Name: THE VILLAGE
Number: 01 464 2516
Hours: 24 hours/7 days
Baud: V21, V22, V22BIS, V23
Features: 8 bit area, ST area, CP/M area

Do you run a Bulletin Board which caters mainly for Atari 8-bit or ST? For an entry in this feature please send us details as above (5 words max on Features!) on a plain sheet of paper headed **RESOURCE FILE – BBS**.

Any background information included will be filed for reference but not published.

USER GROUPS

ABC
Contact Mike Donoghue, 135, St. Leonards Road, Leicester, LE2 3BZ. Tel. 0533 700190. Retailer and both 8-bit and ST user groups.

ATARI USER GROUP (IRELAND)
Contact 100, Silloge Avenue, Ballymum, Dublin 11, Ireland. Tel. Dublin 425918

BOURNEMOUTH AREA COMPUTER CLUB A.U.G. (BACCAUG)
Contact Colin Hunt. Tel. 0202 677895. ST, 8-bit, hardware and software development.

CROMWELL ATARI USER GROUP
Contact Dave Leggett, 3, Chestnut Close, Brampton, Huntingdon, Cambs. Tel. 0480 50553. All users welcome.

The GATEWAY CLUB
Contact Bob Hall, 46, Churchill Drive, Mildenhall, Suffolk, IP28 7DA. Tel. 0683 717723. All computer club with Atari section. Meets once a month.

LONDON ATARI CLUB
Contact Andrew Banner, P.O. Box 319, London, SE15 3NZ. Tel. 01 639 8657 (evenings and weekends). Members anywhere. 8-bit and ST.

MERSEYSIDE ATARI CLUB
Contact Mike Lynch, 24, Oakdene Road, Anfield, Liverpool, Merseyside, L4 2SR. Tel 051 264 8435. ST ONLY. Regular meetings, newsletter and more.

RAGE HARD A.U.G. (8-bit)
Contact Tony Longworth, 13, Greenfield Road, Little Sutton, South Wirral, Cheshire, L66 1PE. Tel. 051 339 0405. For 8-bit users everywhere. Send s.a.e. for details.

SIGATARI
Contact Glenn Leader, 143, Richmond Road, Leytonstone, London, E11 4BT. Tel 01 556 0395. For those interested in more unusual applications.

SOUTH WALES ATARI GROUP
Contact Raymond Price, Mandeville House, 9, Lewis Street, Canton, Cardiff, CF1 8JY. Tel 0222 394592 or 394501

ST CLUB
Contact Paul Glover, P.O. Box 20, Hertford, S13 8NN. Mail only(?). Worldwide.

WORLD ATARI PENPALS Int. User Group (WAP)
Contact Max Terveen, Magerhorst 8, Alphen a/d Rijn, 2402 LP, The Netherlands. Tel. 01720 45583. Members in USA, Canada, France, U.K., Greece, Germany, Saudi Arabia. Have circulating disk (8-bit and ST). Mail only.

Do you want others to know about your group? Send details as above ONLY (5 words max. on Members!) on a plain sheet of paper headed **RESOURCE FILE – USER GROUPS**.

That's all you get! We will not publish any other details as meeting times and places tend to change. Appoint someone responsible to handle any enquiries received.

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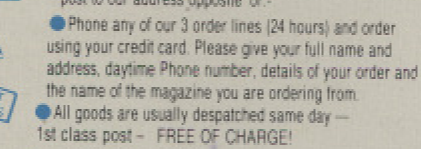
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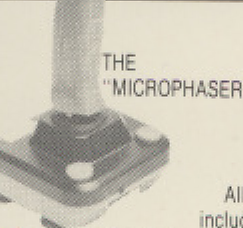


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